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No. 2—Dental Diseases of the Horse *

By

A. C. SHUTTLEWORTH, M.V.SC., F.R.C.V.S.

LIVERPOOL

At the session at which Mr. Shuttleworth presented his paper in the Cambridge Hall, Southport, on the afternoon of Thursday, September 9th, Professor J. G. Wright, F.R.C.V.S., M.V.SC., presided over the assembly, which again was impressively large.

Having introduced Mr. Shuttleworth, the CHAIRMAN went on to say that some criticism had been levelled at them because the paper had not previously been published. He proceeded to explain, however, that Mr. Shuttleworth and Colonel Sinton, the first opener of the discussion, had been given only very short notice. Their thanks were due to them both for having stepped into the breach caused by the alteration of arrangements.

Professor Wright then called upon Mr. Shuttleworth to read his contribution, which was as follows.

With the slow but certain displacement of the horse from the field of transport, his troubles and diseases have received decreasing consideration, being overshadowed by the small animals between the wars, and by the farm animals during the last decade. The great flood of clinical material has dwindled to small proportions and to add to the difficulties, the horse-meat trade steals quite a number of our *post-mortem* specimens.

For these reasons, when dealing with such a paper as this, we must call to our support the work of the outstanding clinicians of the recent past—Harvey, Pillers, MacQueen, Smith, F., and from other fields, the Mellanbys and Colyer. This clinical paper, then, will be based on the work of these men together with our experiences in dental work at Liverpool.

To commence, a few words upon diseases of the incisor teeth—a few words, for it is rare indeed that these teeth, faulty or diseased, lead to clinical ill-health. Beyond examination for age, how often do we even consider the incisors in obvious dental cases? They are remarkably free from disease and cause little or no trouble even in the animals occasionally seen with developmental disorders in this region. Faulty shedding of the deciduous incisors, with retention of a number; the production of several supernumerary teeth leading to a confused crowding with attrition, maldirection and traumatic displacement might be expected to reflect upon the feeding of the animal, but it rarely does. If grazing is interfered with, or an unopposed tooth grows to a dangerous length, it will be necessary to extract or cut the individual interfering with closure of the mouth. In manger-fed horses the incisors are not used at all, the food being picked up by the lips and passed directly to the molars. Examples have been reported of horses thriving despite the loss of the whole range of incisors, and the loss of the body of the mandible from gross fracture.

In many of the cases cited, in which severe crowding, maldirection and rotation of the incisors is present, there is to be seen congestion and inflammation of the gum margin, with retained food in the pockets between the teeth. These factors would suggest the ultimate production of the typical, severe alveolar periodontitis as seen in the molar teeth. It is present in these incisors to a slight degree, but the additional and vital factor necessary to bring about the very destructive form of this disease is absent—the powerful compression of the food pockets by mastication.

The developmental disorders of the molar and premolar regions in the form of supernumerary teeth, abnormally formed, or maldirected teeth are not common, but when they do occur if apposition with the opposing teeth is inaccurate, trouble is bound to arise. The commonest developmental fault is a slight over or under development of the mandible showing as an overlap or underlap at the incisors. This inaccurate apposition, if of some degree in the incisor region, can be said to be accompanied by a comparable overlap of the molar array, giving freedom from wear at the extremities and hook formation. Most frequently seen is the projection of the upper incisors; the upper molars are carried forward to a corresponding degree, giving an overlap and hook of the first upper molar and last lower molar. Merillat considered that the frequent presence of hooks of the first superior molar and the last inferior was due to the normal movement of the mandible during mastication, protrusion and retraction of the mandible being permitted as well as the side to side movement. This backward withdrawal of the mandible relieves the anterior upper molar and the last lower molar from their due amount of wear, with overgrowth as a result. Of course the slow protrusion of the reserve crown of the teeth in herbivorae is the factor which gives the overgrowth and hooking of the unopposed portion of the tooth.

DENTAL CARIES

The two most important diseases of the premolars and molars of the horse are caries and paradontal disease. The former is seen fairly frequently; the latter is the scourge of the teeth of the horse and particularly the heavy breeds.

Clinically, caries commonly remains undiscovered until the disease is very advanced and the damage to the tooth great. Interference with feeding calls attention to some dental fault and on examination it is found that the undermined crown has collapsed, portions are lost, and the gum is lacerated and bruised by the displaced fragments. In some cases the tooth splits into two or three equal portions which spread under the pressure of mastication. Removal of the diseased fragments is usually easy and often can be done with the fingers, but the remainder of the reserve crown or root is still healthy and firmly fixed in the alveolus. Removal of this part of the tooth by forceps is impossible—there is no purchase left for the instrument. Removal by repulsion may be done, but we are rather wary of this operation and undertake it only when no other course is open. In this case the displaced and bruising fragments having been removed the patient should soon commence to feed normally. As time passes, the alveolus being open, paradontal disease may set in. A waiting game in this case is permissible.

Uncomplicated caries gives no indication of its presence and rarely indeed is the disease anticipated when searching the mouth of a dental patient. In our experience we have not encountered a case of caries which, by exposure of the pulp cavity and the resultant pain, has resulted in clinical symptoms of pain and irritability and reluctance in feeding. Our cases have been as described, mass collapse of the undermined crown; the bruised and lacerated gum, and the food packing, being the agent of pain.

Merillat, Colyer and others ascribe a large proportion of caries in the horse to defects of the cement "lakes" on the occlusion surfaces of the molars—the mouth of the infundibulum. This fault is in the form of a persistent canalisation of the cement which normally completely fills this enamel-lined tube. Into this open canal food material is driven, forming a stagnation cavity in which the food remains and ferments. The cement walls are attacked and slough away to leave the enamel exposed and attacked in its turn. Caries of the dentine then produces a large cavity of the crown which ultimately collapses under the pressure of mastication. Why the neighbouring pulp canal is not more frequently opened, to give the very painful reaction which results when exposure or infection of this structure occurs, I cannot say. We know that as the pulp cavity is approached and exposed on the tooth surface during normal wear of the crown, the canal is protectively closed by the formation of secondary dentine, and it may be that such reaction takes place under the threat of a neighbouring attack of caries.

A clinically similar state of affairs is seen in the molars when splitting of these teeth occurs, and as in caries, is seen more

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frequently in the maxillary than the mandibular molars. In these cases the tooth is found to be split on the antero-posterior axis and never transversely. It is split into two unequal parts so that a plate of crown enamel is displaced from the outer face of the upper or the inner face of the lower teeth. The line of cleavage is oblique and passes deeply into the alveolus; the crown spreads under the pressure of mastication and the smaller fragment loosens. Merillat considers this particular accident to be due to an advanced decay of the tooth resulting from alveolar periostitis, pulpitis and desiccation of the tooth. Following this the "layering" of the tooth constituents is weakened and a split occurs at the point of greatest pressure and first impact of mastication. Many of these cases show no sign of advanced paradontal disease, indeed the remaining and by far the largest fragment usually stays still firmly adherent in its socket and defies removal. Some consider, and with evidence, that, careful feeder as is the horse, metal foreign bodies become impacted in the molars to produce carious cavities. It is certain that such an object as a small nail driven into the depth of the crown at the point of greatest pressure may produce an immediate fracture or so weaken the tooth that ultimate splitting will take place. Undoubtedly, too, some of these split teeth are the result of weakening of the crown by carious cavities.

Paradontal Disease

The major dental disease of the horse, and one very destructive in its effects, is alveolar periostitis or pyorrhoea alveolaris, more commonly known as paradontal disease. Many dental cases, whether the original fault be caries, injury or maldevelopment of teeth, have become, when treatment is called for, paradontal cases—this disease completely overshadowing the original condition. It appears to be a disease particularly affecting the heavy breeds, and either mature or elderly animals suffer more severely or it makes its clinical appearance at this age. Young animals, however, are occasionally encountered in this state and some of them are attacked very severely.

The disease attacks the periodontal structures, those retaining and nourishing the tooth—the gum, the periodontal membrane and the bony alveolus. The incisor teeth do not suffer from the destructive form—Colyer mentions that loss of the incisor teeth does occur following this disease. We have seen no such cases, although it is evident in some old horses that there has been some gum retraction in this region.

The primary cause is not clear. May Mellanby considered, following detailed dietary experiments, that a vitamin A deficiency resulted in hyperplasia of the gingival epithelium and degeneration of the nerves to the region. This lack of neurotrophic control may be partly responsible for the incidence of pyorrhea and other gingival diseases. That such dietary deficiencies do happen in the horse has been shown by Mitchell, and they may be the introductory factor, but overlaying this stage, and leading to the very destructive type of disease characteristic of the horse, is the mechanical pressure of mastication.

Colyer, who investigated the condition of the teeth in many horses in the *post-mortem* room, found what he considered to be the very early stages of the disease in a number of cases—certainly a stage many months or years before clinical symptoms could be expected. This early change is due to an injury to the gum where it embraces the tooth at an interproximal space, usually on the buccal face of the maxillary teeth and the lingual face of the mandibular. Undoubtedly injury to the gum margin occurs at other points, but in the slight depression at the junction of the teeth the injurious agent tends to be retained in the gingival sulcus. The gum swells to form an overhang to deepen the cavity, still more securely imprison the foreign body and act as a stagnation area for food material. The cavity deepens and spreads as the thin rim of the alveolar bone is absorbed, particularly between the teeth. The food collecting in the pocket is compressed during mastication, mechanically spreading the fault and tending to separate the teeth and open still further the paradontal membrane and alveolus to infection and trauma. At this stage of the disease, usually met when examining the mouth for a severe lesion elsewhere (for this stage is rarely a source of trouble), the fault can be recognised by the finger nail engaging in the crevice between the diseased teeth, which it cannot do in healthy teeth. In a normal mouth it is extremely difficult to lay the finger tip against the teeth and decide that that is the interproximal point, so closely applied are they. In addition, it is indicative of early paradontal disease if an isolated spicule of hay or chop can be felt projecting from between the teeth either laterally or from the occlusion surface.

To a certain stage the disease is not accompanied by pain—as we know in ourselves, periodontitis followed by retraction of the gums and even loosening of the teeth is not painful, although food packing between the separated teeth causes some discomfort, to be relieved by the tip of the tongue or artificial means. It is usual, in cases presented for operation, to find a very advanced stage of the disease, these animals only recently having shown mastication difficulties. Mouths have been examined in which teeth have been lost due to paradontal disease with no history of difficulty in feeding, and similarly, teeth so loose in their sockets that they would undoubtedly have been lost if they had not been held in position or continually replaced by the opposing teeth. Interference with feeding appears to be due to the discomfort of a tight food pack in the cavity between the separated teeth, or a loose tooth so displaced as to interfere, or so bruising and lacerating the gum as to cause pain. It is apparent that usually horses in the very late stages of the disease become surgical patients.

Although the attention may not be drawn to any dental difficulties, certain side effects have been remarked upon. Pillers mentions recurrent attacks of colic as being due to sub-acute paradontal disease causing defective mastication. He points out, too, that the common fault of sharp teeth is frequently associated with early paradontal disease; the discomfort of the condition interferes with the free and powerful sweep of the jaws so typical of the healthy mouth; the incomplete stroke of the mandible spares the most prominent edges of the teeth from wear so that enamel spikes remain unbroken at the tips of the lateral buttresses of the molars. In some cases, but by no means all, the characteristic spicules of food can be felt projecting between the teeth. What steps can be taken at this stage to stem the progress of the disease? In the general run of practice, I fear, none. Clearing the food pockets and dressing the cavities with astringents as a regular procedure, suggested by Pillers, is impracticable except in isolated cases. Despite such care the food packing is renewed at each meal. Dental prosthetics as described by Becker—bridging the gap and protecting it with metal inlaid into the teeth—is only of academic interest.

As the disease progresses and bone destruction takes place, it may be, by ill luck, that the floors of the sinuses are punctured leading to a purulent sinusitis. Merillat has said that 95 per cent. of the chronic nasal discharge of the horse is due to dental disease—this is usually via the sinuses (and in our experience via the superior maxillary sinus, the site of entrance being between the last two molars), or direct into the nasal chamber due to a break-through of a root abscess involving the first or second premolar. We have had several cases of the latter type of nasal discharge.

In the mandible, deep infection of the periodontal membrane may lead to a dento-alveolar abscess—the pus being trapped at the apex of the root. It may, particularly if involving the anterior premolars, break to the exterior on the edge or side of the mandible, leaving a thick-walled, bulky mass of new bone surrounding the fistula. Not infrequently, particularly in the young horse, the walls of the mandible at the great depth of the root apex are sufficiently strong to resist penetration. An osteomyelitis results as the infection breaks into the medulla of the bone. Tooth alveolus after tooth alveolus is destroyed as the infection sweeps through, causing great destruction of the bone. The widespread damage in these cases makes it impossible to say whether the root abscesses arise from extension of the chronic type of paradontal disease—passing deep into the alveolus from the mouth, loosening the tooth, and the plunger-like action of the loosened tooth under mastication driving the infection from the alveolus into the medulla—or as sometimes is to be seen, an acute abscess, from some systemic disease, or infection traversing the pulp cavity to the apex. Harvey considered that the symmetrical manifestation of paradontal disease, that is one or more teeth on each side of the jaw affected to about the same degree, may be due to a latent local focus of some such disease as navel-ill, the acute root abscess evacuating along the plane of the periodontal membrane to the mouth and loosening the tooth in the process. Without prior evidence of swelling over the roots at an early stage it is impossible to say whether the end result is due to chronic or acute periodontal disease. We know that the acute type does occasionally arise, having opened such abscesses by trephining.

We may now consider the complication of the facial sinuses when the posterior molars are affected. Puncture of the floor of the sinuses may take place in three situations.

1. Between two teeth due to destruction of bone. This may occur early in the course of the disease, at the site of onset which has been mentioned. A case examined, and again *post-mortem*, was found to be suffering from paradontal disease, with puncture of the sinus directly due to the presence of a supernumerary molar tooth in the upper array. These seven molars were opposed by the normal six, giving a severe over-

hang and sturdy hook formation of the last upper molar. The trauma of mastication against this tooth had slightly displaced it backwards; paradontal disease had invaded the gap and puncture of the sinus had taken place at the same point.

2. At any other part of the alveolus in the course of the invasion of the periodontal membrane. Several cases have been seen which, on examination, have shown definite but not gross paradontal disease of the last molars. There was food material between the last teeth and the last molar moved very slightly under lateral pressure. On removal of this tooth, the apex of the alveolus was found to contain a mass of putrid food material. Probing this alveolus for the point of entry into the sinus was not very convincing, but it was thought that some part of the apex had broken down. It is considered that this loose tooth, still fitting well in the socket, had acted as a plunger under the pressure from the opposing teeth, compressing the trapped pus and food material and ultimately breaking through the weakened bone.

3. At part of the alveolus due to the rupture of an acute apical abscess—not associated with chronic paradontal disease This may account for those cases of pus in the sinuses in which the teeth are apparently healthy. Apart from generous trephining and search of the sinus, X-ray diagnosis appears to be the only method of determining the offending tooth.

You will recall that the only communication between the facial sinuses and the exterior is by a narrow, slit-like opening into the middle meatus of the nasal chamber, through which ventilation of the cavities takes place. This crevice when still further narrowed by the thickened and inflamed mucous lining of the diseased sinus, obviously cannot pass the clots of pus and food material that are seen in many cases of purulent sinusitis. That a large opening is present from the diseased sinuses to the nasal chamber is further demonstrated by the profuse flow from the nostril when irrigation of the sinuses is carried out—particularly if a hose pipe from a tap is used; the outflow is as rapid and as great as the inflow. There is a huge gap in the sinus system somewhere.

The course of events appears to be:

1. Puncture of the wall of the alveolus (floor of the sinus) following rarefaction and absorption of the bone.

2. Infection of the sinus, which gradually becomes filled with pus. This is virtually an abscess and as in all abscesses, worrying to the exterior is characteristic. There is no easy exit to this closed cavity of the superior maxillary and frontal sinuses, but the thinnest wall is the plate of bone forming the division between the superior and inferior sinuses. This thin bone is broken down, either by direct pressure of the pus or by rarefaction and absorption due to the hyperaemia of the associated, inflamed mucous membrane. The mucous membrane, now unsupported, bulges through the gap, ruptures and empties the purulent contents into the inferior sinus. If such rupture does not occur due to unusual strength of the bony division, another wall must suffer, and will lead to that condition that I have heard about but never seen, softening of the maxillary bone on the face.

3. The superior and inferior and frontal sinuses now being one huge abscess, the break-through is again via the weakest point, now the mesial wall of the inferior maxillary sinus, composed of the fragile ventral turbinated bone, and so directly into the middle meatus.

Other Dental Deformities

The long-date changes in the mouth, secondary to disease and caused by the slow extrusion of the reserve crown, may be widespread and affect the whole of one side of the mouth, or affect individual teeth. The first, known as shear-mouth or shear-bite, follows some painful diseased condition that has been present for a long period. There has been persistent one-sided mastication so that the painful side escapes normal wear, this being due to the differing width of the dental arches of the mandible and maxilla, and the narrowness of the lower compared with the upper molars. Despite the care to avoid the painful teeth, some lateral attrition takes place and they are worn into the wedge shape so characteristic of this deformity. Some horses appear to manage quite well with but half the mouth functioning, and it is late in the day when the overgrown and chisel-edged teeth give rise to obvious difficulty by wounding the opposing gum. Individual pairs of teeth may take on this wedge shape by a slight lateral displacement of one of the pair.

With regard to other dental disarrangements, I would refer to step-mouth, in which the fingers, when passed along the molar array, meet abrupt obstacles in the form of step-like prominences of individual teeth. This state has been considered to be due to differences in resistance to wear in neighbouring teeth. I think that this is a rather broad and rather vague supposition, and prefer to regard all these faults as due to complete or partial loss of opposition with overgrowth of the unopposed member: complete loss of opposition in the case of an extraction, and partial and temporary loss of opposition when the crown of the opposing tooth is lost, to a great or small degree, following a collapse in caries or splitting of the crown. Mastication can function reasonably well in these cases although the posterior movement of the mandible is impossible. Lateral movement is quite good, the prominent crowns wearing a track for themselves upon the opposing teeth. Where there is no opposition, such as is the case following extraction, the overgrown tooth projects into the empty space and ultimately comes within reach of, and bruises, the gum. Following extraction of a tooth there should be routine examination of the overgrowing member, which will require rasping or cutting to keep within bounds.

Diagnosis

The diagnosis of dental disease is based almost solely upon feeding difficulties—frequently very obvious feeding difficulties—that denote advanced changes in the teeth. In these cases the examination of the mouth with the horse standing, with or without gagging, will probably be sufficient to expose the badly diseased state that we expect. For more detailed examination it is very necessary to have the patient under secure control, and we prefer to have the horse cast, narcotised and well gagged. Then, visually to some extent, but far more with the fingers, the mouth can be explored undisturbed, searching for the interfering hook, the telltale spicules of food driven between the teeth in early paradontal disease or projecting from the carious cavity on the occlusion surface.

Radiology as a means of diagnosis of dental disease in our animals is an almost untouched field. So definite are the usual cases that such aid is unnecessary, while so unsuspected are the early stages of these diseases that we rarely meet them. There may be a place for radiology in those cases of debility of unknown origin in which the teeth, among other factors, are under suspicion.

Treatment

Treatment consists almost solely of extraction of diseased teeth and removal of prominences—correcting the bite. No progress has been made towards checking the diseases in their course, largely because we have no evidence of their presence until extremely late. Becker, in several publications before the war, described his technique for drilling clean and filling with copper amalgam carious cavities in the cement of the occlusion surface, and taking impressions and fitting caps and bridges across areas of paradontal disease. Such early diagnosis and lavish care can only be carried out in a few chosen cases.

I have touched but lightly upon parts of the field of dental diseases. Details of methods of treatment, surgical technique and instruments all remain for further discussion. With the cream of the veterinary clinical world before me, I hope to learn something of your varying experiences and opinions.

Discussion

The Chairman called upon Col. W. L. Sinton, M.B.E., M.R.C.V.S., to open the discussion.

Col. W. L. Sinton: Mr. Shuttleworth's paper will bring back many memories to those of us who remember when the horse was the main subject in veterinary practice—memories of interesting cases and of success and failure in the conditions mentioned. To the younger generation whose acquaintance with these conditions is sporadic, due to lack of material and the partial eclipse of the horse, it should be of great interest.

I do not propose to offer criticism but rather to outline some aspects that will, I hope, amplify the paper.

The incisor teeth call for little comment except to say that animals have been seen whose teeth have been dislodged due to a fall and could be removed easily by hand, and occasional cases where the teeth have been fractured presumably due to the same cause. One case only has been seen where the alveolus of a central incisor was affected, the gum had receded and the root of the tooth was exposed throughout its length. This case showed no clinical symptoms.

The molar teeth, as pointed out in the paper, seem able to undergo many changes without any indication of pain or other ill-effect on the health of the animal. It is, however, pertinent to inquire whether these would not be observed if a closer examination was made and if closer attention was given to the animal by its attendant. An extreme example is that a veterinary assist-

ant once informed an owner and myself that he had examined and dressed the teeth of a mare in poor condition. Not satisfied, I put my hand in the animal's mouth and pulled out three separate teeth with my fingers.

It is remarkable how seldom pain is a prominent symptom and this, I think, may be put down to the slow development of the caries which permits the secondary dentine to form and protect the pulp cavity as in normal growth. If pain was a marked symptom in equine dental disease no doubt more regular and thorough examination of the teeth would be made, but how rare is it to have a horse's teeth examined as a routine measure. Even when horses are examined for soundness the dental examination, other than of the incisors for age, is cursory and often incomplete.

Amongst the causes predisposing to abnormalities of teeth irregular formation—hog- and parrot-mouth—has been mentioned. These are hereditary defects that I have seen transmitted through four generations in thoroughbred horses. If they are present in the sire or dam, or both, a foal with a normal mouth can only rarely be expected. A thorough examination of all breeding stock is, therefore, advisable to avoid future trouble.

Environment is another factor of importance. In one stud with which I dealt osteoporosis was present. It can readily be imagined that with the loss of skeletal calcium due to calcium phosphorus imbalance the condition of the teeth was poor and that many were loose or absent. In other places where there was no clinical, and I believe no chemical, evidence of calcium phosphorus imbalance, old mares were seen without a molar tooth and many other mares had lost two or three molars. In the latter area it is interesting to note that a few years earlier a mineral supplement had been recommended and was then being fed.

Vitamin "A" deficiency has been recorded as a predisposing cause of dental decay or rather of the tissues surrounding the teeth. In the above cases the diet contained ample green fodder, and a grain supplement was fed as well.

External injury should also be noted as a predisposing cause. How often has one seen a horse with a swelling on the face due to injury and which responds to simple treatment in a few days. One such case comes to mind where the swelling persisted and a hard bony growth developed. Six months later caries of a molar in this region was noticed. The case, of course, was fracture involving the alveolus.

Mr. Shuttleworth states that alveolar periostitis particularly affects heavy breeds of horses. I cannot say that this is my experience in the stud with which I am at present connected. The horses seem comparatively free of this complaint. This may be due to the fact that the majority have not reached the elderly stage noted in the paper as well as to careful selection at purchase.

A case of caries having developed over a period without recognition, the thing most likely to be noticed will be a bad smell from the animal's mouth. About this time quidding of the food may also be present or an unilateral nasal discharge. In one case a thoroughbred stallion was seen with marked hypertrophy of the temporal muscles on the right side and very little else noted except that he fed slowly. The fourth left upper molar showed caries.

The first essentials for an accurate diagnosis are control of the animal, a good light, and a gag that does not slip easily. With difficult horses it may be necessary to cast with hobbles, but if this is done all arrangements to operate at once should be made. In a simple case of caries of the fourth or fifth upper molar the technique of extraction is well known. In the cases that I have dealt with many horses have been comparatively young, under ten years, and I have preferred to trephine and to repulse from inside the maxillary sinus. During repulsion the ethmoid plate in the superior maxillary sinus may have to be broken down to get room to work. This is of little importance. It is another matter, however, if the septum dividing the superior and inferior maxillary sinuses is broken or damaged, as a septic condition may be set up which is difficult to treat due to the poor drainage from the inferior sinus. A similar condition may arise when a third molar is repulsed through the inferior maxillary sinus; often the wound heals well until a small opening, too small to admit a probe, remains. There a head of pus constantly recurs and necessitates a further operation.

In using repulsion the sound emitted is important, as a more hollow tone is given when striking a diseased or broken loose tooth than when striking bone.

A word of caution may be given about second operations. Let no one lightly undertake to operate on an animal that has had part of a tooth left behind at an earlier operation. He will find a dense alveolar periostitis that will require time and patience. If any doubt exists that the first operation was not cleanly finished a further operation should be performed early, and in any case within two to three weeks, before the ostitis is organised.

A further interesting case may be mentioned. This was an extraction of a sixth upper molar. The first attempt was unsuccessful due to the trephine opening being too low down and to using punches suitable only for a fourth or fifth molar. At the next attempt the trephine opening was made just below the eye at the highest point of the superior maxillary sinus, careful dissection being done to deflect muscle and avoid nerve and blood supply. Special curved punches had been prepared and repulsion attempted. When, however, the tooth showed about $\frac{1}{4}$ inch below the molar table it was realised that it would shortly be in contact with the sixth lower molar. Forceps were applied and extraction completed by using lateral movements.

In after-treatment a point that may be overlooked is that of taking the animal's temperature. This should be done for several days as occasionally a febrile condition arises which has serious effects. Recent work indicates that this is due to a streptococcus.

I would like to mention anaesthesia. I have generally used chloroform, but, as the muzzle has to be removed for dental operations, I have found that the anaesthetic effect is not sufficiently prolonged and that one does not get that complete relaxation of the lower jaw that would be so desirable. I have not used chloral hydrate intravenously as the risk with valuable animals was too great, but from its effect for other operations it would appear excellent for dental operations. I will now relate an experience with morphia. Being literally hundreds of miles in the "blue" I wanted a preliminary narcotic to cast a thoroughbred stallion to remove a fourth upper molar. I gave 4 grs. morphine hydrochloride and the results were amazing. The stallion had a period of intense sexual excitement and it took ten men to control him. Eventually he relaxed and it was possible without danger to put on hobbles and cast him quietly. Chloroform was then administered and the tooth extracted. It was this horse in which hypertrophy of the temporal muscles was noted.

The extraction of lower molars is a more straightforward affair but rough handling should be avoided in case a fracture of the mandible is present or produced during the operation.

Many other aspects of this subject will, I am sure, emerge during the discussion and I will, therefore, offer my thanks to Mr. Shuttleworth for his excellent paper. It has given me great pleasure to open the discussion on it.

General Discussion

Mr. D. Balls (Dorking) said that it was with some trepidation that he had again approached the platform, but had not been able to resist doing so because his interest in horses was very great. Though one of the younger members of the profession, he had been interested in and connected with horses all his life and in his part of the country dealt mainly with hunters. His conclusions did not come to quite the same as those of Mr. Shuttleworth, particularly on the question of shear-mouth. Owners did now approach them very much sooner with regard to this disease and about dental diseases generally. The horses which were now between seven and fourteen years of age had suffered rather a rough deal during the war. Many of them had been turned out to graze for long periods which had brought on signs of shear-mouth much sooner than they would normally have occurred. Instead of this condition occurring when the animals were ten to twelve years of age it now occurred when they were six, seven or eight.

He had not found that paradontal disease existed to any great extent in these cases. The trouble appeared to be an early shear-mouth with the third and fourth molars involved, sometimes fairly marked on the first and second. The animals responded well to treatment for such a condition and were usually not seen again for some time. In other cases there was a very marked shear-mouth and a very soft dentine, and despite full treatment the condition was often found to be as bad again the following year.

The Chairman said that as no one else wished to contribute observations, he himself would make a few remarks. Veterinary surgeons should take great care when examing for soundness horses with malposition of their incisor teeth to ensure that their molar teeth were normal. Epignathia was common and affected animals were prone to develop "hooks" on the anterior molar in the upper jaw and the posterior molar in the lower. The one involving the upper jaw was generally small but that associated with the posterior tooth in the lower jaw, was often large and buttress-like and eventually interfered with mastication. His experience was that horses so affected first showed clinical symptoms between the ages of nine and eleven years. The appropriate treatment was to remove such hooks by cutting them with dental shears. Frequently the act of cutting so loosened the remaining portion of tooth that its removal was relatively easy. It was true to say that animals should not be passed as sound

until some consideration had been given to the condition of their molar teeth for otherwise they might be let down very badly in the course of a few years. He had been impressed on *post-mortem* examinations of horses with gross shear-mouth and step-mouth by the pumice-like nature of affected teeth and the smoothness of the masticatory surface. The latter did not possess the irregularity which was an essential feature of equine teeth and was necessary for efficient grinding of their food. He was attracted by Mitchell's hypothesis, that it was probable that many of these diseases associated with the calcified tissues of the body, and which often developed late in life, had their origin in dietetic deficiences during youth. He would not attempt to specify the exact nature of the deficiency but dental hypoplasia was a well recognised entity in both human and canine pathology. Such conditions were more often met in the heavy breeds of horses. He had been impressed by the relative neglect with which farmers treated young horses of the heavier breeds after they had left their dams. There was no immediate profit to be had from them and they were often turned out "on the moors" and forgotten; consequently they often found animals during the second and third years of their life to be extremely weedy, yet this was a period of great importance in the development of calcified tissue, bones and teeth. Moreover, dental development went on in the horse for a considerably longer period during their span of life than in some of the other animals with which they were familar. He would commend to the study of their pathologists the structure of the teeth of horses suffering from gross dental disease, for he thought that it was through that medium they were most likely to obtain the answer to some of their problems.

The Reply

Mr. Shuttleworth—in reply—said he was sorry that not more than two gentlemen had taken part in the general discussion, but they had spoken on common points such as the importance of examining horses' teeth, which of course applied particularly to horses of any value. Certainly a "pup" might be bought if a thorough examination of the teeth was not made, and it was common knowledge how severe dental diseases could become if they were neglected due to a lack of clinical symptoms. Damage could be going on for many months before clinical symptoms occurred.

Colonel Sinton's observations had been most interesting. He was in charge of a stud of horses and was able to give far greater detailed care to his cases than the ordinary run of practitioners. It was obviously an advantage if proper care was given to prevent faulty feeding, and if careful examinations were made. He was not sure that it was wise to carry out examinations with the horse standing and said that he always liked to have a good gag. On the following day there would be specimens at the Liverpool Hospital and he would point out the one he used. It was not marketed but was home-made and very much on the lines of the balling gag with a very wide opening for the manipulation of forceps.

He considered repulsion as quite a major operation. In old surgery books they spoke very lightly of repulsion in extraction of teeth, but their forceps were not of the type or efficiency such as were used to-day. He never approached a case of repulsion happily.

With regard to anaesthesia, the use of chloroform could be an awful pest with the mask continually in the way of the gag and instrument. He consistently used chloral anaesthesia which could certainly be recommended.

Mr. Balls had mentioned shear-mouth, early evidence of which was described as sharp-tooth. The lateral edges of the molars gave a very exaggerated chisel edge and in some cases any attempt to correct the particular side of the mouth was out of the question. Clipping invariably resulted in extraction of the teeth. It had to be recognised that where the physiological restraint of opposing teeth was absent the teeth grew far more rapidly than normal teeth.

Professor Wright had mentioned the smooth surface that was found on shear-mouth teeth. This smooth surface was also found with step-mouth. In Mr. Shuttleworth's experience this was almost invariably associated with very old horses which had worn out the enamel structure and were bearing on the dentine of the teeth just above the roots; all the rough surface had disappeared and certainly no mastication could take place. The other type of smooth mouth was due directly to the attrition of tooth against tooth, without the normal intervening food mass. To keep the rasp-like surface of the teeth, food had to be present between them. The fibrous pad of food wore down the softer dentine, while the harder enamel remained unworn. This projected through the food pad to meet the enamel projections of the opposing teeth and in this way the harder structure was kept at normal height. Where no food pad was present between the teeth for a long period, such as occurred in shear-mouth, the enamel pattern wore down to the level of the dentine and then polishing of the two surfaces resulted

Yet another type of smooth-mouth was due to a prolonged soft diet. Probably a horse showing such symptoms either chose the soft part of his food or had been given a diet of mashes over a period. There would not be enough fibre to wear down the dentine, the two enamels would meet too early and wear down and the same chain of events would result—the enamel and dentine would wear against each other, producing a smooth and polished surface. In such cases a broad saw-like surface was left where the lateral movement of the teeth cut a track, but the masticatory surface would be quite smooth.

Mr. Shuttleworth concluded his reply by thanking everyone for having listened so patiently to his paper and repeated his regret on the limited scope of the discussion.

CLINICAL COMMUNICATION

Swine Erysipelas in Ten-day-old Piglets

R. J. SINDREY, M.R.C.V.S.
Stafford
and
G. H. CREYKE, B.Sc. (Agric.)
Student, Royal Veterinary College

History.—Out of a ten-day-old litter of large white piglets, two had died, believed by the owner to have been trodden on by the gilt. The owner had noticed a peculiar bluish discoloration of the dead piglets.

Symptoms.—When the first visit was made one piglet was *in extremis*, the others being apparently healthy. The body of the affected piglet showed a bluish discoloration especially marked at the extremities. Temperature was subnormal (101° F.). Pulse was hardly discernible. Auscultation of the lungs revealed bronchial râles on both sides of the chest.

Diagnosis.—A tentative diagnosis of congenital heart disease and pneumonia was made and the piglet was destroyed.

Post-mortem Examination. This showed that:—

(*a*) There were petechiae on the kidneys.

(*b*) There was a slight deposit (crystalline?) on the pericardial surface of the heart, but internally this organ was normal.

(*c*) Pneumonia was slight and quite inadequate to account for death. Cultures revealed Gram-positive short rods believed to be atypical *Erysipelothrix rhusiopathiae.*

A culture of the germ was submitted to the Ministry Laboratory at Weybridge for further typing and the report received confirmed the suspicion that it was atypical *Erysipelothrix rhusiopathiae* infection.

Treatment.—The remaining piglets were given 10 c.c. swine erysipelas serum and this succeeded in checking the outbreak. Prior to this treatment, three further piglets died, all of which showed similar symptoms, death occurring within 36 hours of onset of symptoms.

Discussion.—We report this case because of the uncommonness of *Erysipelothrix rhusiopathiae* infection in pigs so young.

Acknowledgments.—We are indebted to Mr. W. H. Parker, B.Sc., M.R.C.V.S., Veterinary Investigation Officer of the Ministry of Agriculture and Fisheries, Wolverhampton, for the pathological examination and to the Ministry's staff at Weybridge for typing the organism.

MORE LIVESTOCK EXPORTED

Mr. A. G. Bottomley, Secretary for Overseas Trade, speaking at a meeting of the Livestock Export Group in London, said that exports of livestock during the first three-quarters of this year were worth £3,200,000—only £374,000 less than the total for the whole of 1947. Before the war the annual total was under £750,000. Exports to hard-currency countries were under £400,000 last year. Difficulties due to quarantine regulations and the development of local breeding might have to be overcome, but exports of livestock could play an important part in the battle to close the dollar gap.

* * * * *

Weekly Wisdom

I have more confidence in the dead than in the living. . . . The dust and smoke and noise of modern literature have nothing in common with the pure and silent air of immortality.—William Hazlitt (1821): "On Reading Old Books."

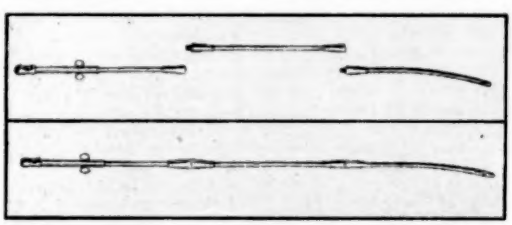
NEW INSTRUMENTS AND APPLIANCES

An Easily Sterilisable Neilsen's Catheter

EDWARD WILKINSON, M.R.C.V.S.

Derby

In order to obviate the difficulty of efficiently sterilising Neilsen's 20 inch uterine catheter it was sectioned into three pieces, as illustrated, each section being approximately 6½ inches long. The catheter is quite rigid in use and the joint nearest the exit end in no way interferes with its passage into the uterine cornu if this is desired. In practice it is our routine to carry several sectioned catheters and lengths of rubber tubing in a shortened type of metal carrying case, all being sterilised at the surgery by boiling for 25 to 30 minutes. Also the sectioned catheter can be readily boiled at the farm in an ordinary sauce-pan should one be called upon to carry out uterine irrigation without prior notice.



It is felt that this method is much superior to the practice adopted by many practitioners of using one catheter for T.T. herds and another for non-T.T. After all, one has a duty to the non-T.T. farmer. Also it is much to be preferred to the practice of leaving a catheter at each farm (as one is assured is routine in one well-known practice) as well as being much cheaper!

The instruments (catheter and carrying case) have been made by Messrs. Arnold and Sons, from whom they are obtainable and to whom my sincere thanks are due.

ABSTRACT

[Conjunctivitis and Keratitis of Cattle and Sheep. Blakemore, F. (1947.) *J. comp. Path.* **57**. 223.]

The condition is not uncommon in East Anglia in lambs and is often associated with concurrent diseases such as joint-ill, or parasitism, as well as periods of severe weather.

Initially there is a simple conjunctivitis with hyperaemia and profuse lachrymation. Recovery may occur in a week or lead on to a chronic state, with opacity and ulceration of the cornea.

The condition was readily set up in 48 hours by the instillation of a few drops of lachrymal discharge into the corneal sac of normal lambs, but other experimental animals remained resistant, from which the author concludes that the tissue requirements of the causative agent must be specific. It spreads rapidly by contact in an experimental flock. Recovered animals are capable of remaining carriers, at least in some instances, for as long as 120 days. Beveridge in Australia proved 19 recovered sheep to be resistant to infection for 100 days, but Blakemore was only able to continue his observations for 48 in this respect, when immunity persisted. He suggests that the far greater incidence of infection in lambs as compared to sheep may be due to the fact that the latter has developed an immunity as a result of previous contact. The nature of the inclusion bodies considered to be intimately associated with the disease is discussed. They do not appear to fit into the class of viruses nor do they readily fall into the Rickettsia group.

Two cases of a similar condition are described in bovines. Conjunctivitis was severe and lachrymation profuse, but the cornea was not affected and recovery occurred spontaneously. Inclusion bodies were observed in lachrymal discharges and a mild short-lived infection was established experimentally. Evidence that the condition is a specific infection such as that in the sheep is, however, not strong.

N. S. B.

REPORT

Artificial Insemination

Report to the Milk Marketing Board for the Year April 1st, 1947, to March 31st, 1948

[This report is reproduced in full below, with the exception of an Appendix relating to bulls purchased and on hire, in order that, in particular, members of the profession may thereby be provided with information which it is felt will be extremely useful to them in the course of their practices and that the profession in general may be made acquainted with developments in the important field of artificial insemination.]

1. Introduction

The year April 1st, 1947, to March 31st, 1948, has again seen very rapid progress in A.I. development. As Table I shows, the number of main centres in operation has increased by two. In addition the number of sub-centres or points from which service is available has risen from seven to 23. Given an operating radius of approximately ten miles per centre and sub-centre, this means that A.I. coverage extends now over an area of nearly 12,000 square miles as compared with 5,000 square miles in the previous year.

Table I

Name of Centre	Date of opening
Little Horwood (Buckinghamshire)	August, 1942
Beccles (Suffolk)	December, 1943
Cheswardine (Shropshire)	January, 1946
Shincliffe (Durham)	February, 1946
Carmarthen (Carmarthenshire)	November, 1946
Torrington (North Devon)	November, 1946
Frant (Kent)	December, 1946
Welshpool (Montgomeryshire)	February, 1947
Sturminster Newton (Dorset)	March, 1947
Opened during the year:	
Tarporley (Cheshire)	December, 1947
Chippenham (Wiltshire)	March, 1948

The current year will see a substantial increase in the number of operating main centres. The Praze (Cornwall) and Gloucester centres have been completed since the start of the new year and building is going on at Writtle (Essex), Tean (Staffordshire), Whalley (Lancashire), Clyst Honiton (East Devon) and Penrith (Cumberland). Buxton (Derbyshire) and Burley-in-Wharfedale (Yorkshire) should also be ready within the year.

2. Growth in Membership and Numbers of Cows Inseminated

The number of members using Board centres since the start of the service is as follows:—

Year	Number of members	Number of paid inseminations	Cows per member
1946	922	6,401	6·9
1947	4,420	25,535	5·8
1948	12,766	90,173	7·1

The number of cows per member cannot yet be regarded as an indication of the average size of herd using A.I., for the increase of 8,000 members during 1948 has taken place over the year and in many cases only a part of the herd has so far been inseminated.

The fact that new members are increasingly deciding at the outset to use A.I. permanently is shown by the proportion of "life" to "annual" memberships. Of the total membership more than two-thirds have been enrolled in the former category and at the most recent centre to be opened (Tarporley in Cheshire) the proportion is six to one.

At some centres the growth of membership (Table II) is very striking; the Beccles and Little Horwood centres, which have been going for four to five years, have had their largest increases during the past year—approximately 100 per cent. in each case. Cheswardine now has 2,269 members (1,584 in 1947) and Carmarthen, which began the year with 314 members, ended with 2,122. The following table gives membership for each centre:—

TABLE II

Centre	Membership as at: April 1st, 1947 Life	Annual	March 31st, 1948 Life	Annual	Total
Little Horwood	—	643	885	580	1,465
Beccles	—	875	947	578	1,525
Cheswardine	—	1,049	1,584	685	2,269
Shincliffe	—	697	928	463	1,391
Carmarthen	—	314	1,447	675	2,122
Torrington	—	441	852	321	1,173
Frant	—	217	774	305	1,079
Welshpool	—	67	420	213	633
Sturminster Newton ..	—	117	479	215	694
Tarporley	—	—	302	50	352
Chippenham	—	—	51	12	63
Total	—	4,420	8,669	4,097	12,766

3. Number of Cows Inseminated by Centre and Breed

Table III gives an explanation of the number of cows inseminated for each centre under the breed of bull used.

TABLE III

NUMBER OF PAID INSEMINATIONS BY CENTRE AND BREED APRIL 1ST, 1947, TO MARCH 31ST, 1948

Centre	Friesian	Shorthorn	Ayrshire	Guernsey	Jersey	R. Poll	Devon	Beef	Total
Beccles	7,919	1,900	70	3	540	1,004	—	39	11,475
L. Horwood	2,348	2,773	351	1,095	95	—	—	95	8,377
Carmarthen	4,906	4,399	997	—	72	1	—	39	10,414
Cheswardine	11,840	5,059	3,001	81	72	1	—	1,142	21,196
Chippenham*	14	45	—	4	—	—	—	—	63
Frant	741	2,339	734	1,565	194	—	—	75	5,648
Shincliffe	2,255	5,403	1,923	18	81	—	—	251	9,931
St. Newton	2,060	2,861	422	700	110	—	—	237	6,330
Tarporley†	1,499	636	718	19	3	—	—	163	3,038
Torrington	1,083	4,065	1,534	399	75	—	1,201	45	8,322
Welshpool	2,325	686	492	64	17	—	—	576	4,160
Total	36,850	30,166	10,242	3,948	2,069	1,005	1,201	3,472	88,954

* Chippenham commenced operations March, 1948.
† Tarporley commenced operations as a sub-centre to Cheswardine on December 1st, 1947, and as a main centre on March 1st, 1948.

It will be seen that bulls of the Friesian breed are in first demand (36,850 cows) with Dairy Shorthorns a close second (30,166). The demand for Ayrshires has increased during the year and expansion is to be seen in the Shropshire, Kent/Sussex and North Devon areas. It is still too early to say much about breed preference; for example, among the remaining breeds listed in Table III there are some for which it is only in recent months that representative studs of bulls have been established.

4. The Beef Semen Scheme

Special mention should be made of the beef inseminations (Table III). In August, 1947, the Ministry of Agriculture asked the A.I. movement, in the interests of a greater production of home beef, to operate a free insemination service from bulls of the colour-marking beef breeds, and, with a certain amount of misgiving, this was agreed to. (The Board receives the A.I. fee at the commercial rate through the Treasury guarantee.) In a letter to each member of Board centres the purpose of the scheme was explained and a service from Hereford and Aberdeen Angus bulls was started in October, 1947. By the end of March 3,472 cows have been inseminated with beef semen and the Ministry of Agriculture, which is responsible for seeing that the scheme is not misused by the insemination of good dairy cows that ought to be bred to dairy bulls, has reported to the Central Advisory Committee on A.I. that it is working satisfactorily.

The real test, however, is still to come; at least some of the beef cross-breds will undoubtedly be good-looking animals and there will be a temptation to keep them in the dairy herd. There is a report of this result at a centre in the United States where beef bulls were used to cross on low-yielding dairy cows and where now bulls of a dual-purpose breed (Brown Swiss) are being substituted.

Before the introduction of the beef scheme two centres had already decided to keep beef bulls—the Little Horwood centre, to meet the needs of members in Northamptonshire, and the Cheswardine centre, for the southern part of Shropshire and for Montgomeryshire. In the new situation it was decided to station the majority of the beef bulls in these areas. The Board are greatly indebted to the Northamptonshire Institute of Agriculture for the excellent facilities it has provided for what is, in fact, a beef-bull centre; from this up to 90 parcels of beef semen have been distributed each week to a number of Board centres.

The Devon inseminations referred to in Table III are from beef bulls, though as the breed is not a colour-marking one they are not in the free beef category. The demand is interesting as an indication of the convenience, etc., of the A.I. service; these inseminations have been carried out at the 25s. rate, although service from premium bulls of the same breed is available in the area at a much lower fee.

5. The Seasonal Nature of the Work

In the report for the previous year the seasonal nature of the work at the Buckinghamshire and Suffolk centres was commented upon. Table IV gives the results for the current year, which indicate a still greater concentration upon inseminations to give calvings for winter milk. In the Buckinghamshire area 78·4 per cent. of the year's inseminations were carried out in the six winter months (1947 report: 70 per cent.) and the figure for the Suffolk area was 74·6 per cent. The concentration is less extreme in the Shropshire and Durham area—61 per cent. in the former and 59·6 per cent. in the latter. For the South Wales area (not quoted in Table IV) there is evidence of two breeding peaks—one for winter calvings and another in late spring when the cows go out to grass.

TABLE IV

INSEMINATIONS BY SEASON

Centre	Total inseminations No.	%	April to June No.	%	July to September No.	%	October to December No.	%	January to March No.	%
Beccles (Suffolk)	11,475	100	1,898	16·5	1,019	8·9	3,729	32·5	4,829	42·1
L. Horwood (Bucks)	8,377	100	1,124	13·4	685	8·2	2,596	31·0	3,972	47·4
Cheswardine (Salop)	21,196	100	5,136	24·2	3,160	14·9	5,974	28·2	6,926	32·7
Shincliffe (Durham)	9,931	100	2,305	23·2	1,705	17·2	2,775	27·9	3,146	31·7

6. Conception Rates*

(a) *Conception Rate by Centre and Season*

Table V gives conception rates for each centre and for each quarter of the year in which the inseminations were carried out. The average conception rate (63,495 first inseminations) is 64·4 per cent. (1947 report: 64·6 per cent.) and this is held to be satisfactory when compared either with results from normal mating or with conception rates obtained elsewhere. The range is between 69·5 per cent. (Carmarthen) and 59·2 per cent. (Shincliffe) and it is tempting, even at this early stage, to correlate this difference with differences in herd fertility (see Table VIII). In the Carmarthen area the tuberculosis eradication scheme is well advanced and this, combined with good herd management, may be responsible for the result.

TABLE V

ANNUAL AND QUARTERLY CONCEPTION RATES BY CENTRES (January to December, 1947)

Centre	Total	%	January to March No.*	%	April to June No.	%	July to September No.	%	October to December No.	%
Beccles	9,505	61·6	2,859	62·5	1,898	60·7	1,019	57·1	3,729	62·7
L. Horwood	5,881	69·5	1,476	71·7	1,124	71·8	685	73·6	2,596	66·1
Carmarthen	6,639	69·5	579	71·5	1,378	66·3	1,399	72·1	3,283	69·5
Cheswardine	17,767	65·2	3,497	63·1	5,136	62·4	3,169	69·3	5,974	66·6
Frant	3,521	62·1	653	58·9	739	65·8	484	64·7	1,644	60·9
Shincliffe	8,495	59·2	1,710	61·9	2,305	59·2	1,705	55·4	2,775	59·7
St. Newton	3,298	64·8	—	—	703	63·8	568	68·4	2,027	64·7
Torrington	6,112	64·3	733	67·3	1,293	59·4	1,381	69·7	2,705	62·9
Welshpool	2,278	65·1	137	63·5	477	66·7	409	62·8	1,255	65·4
Total	63,495	64·4	11,644	64·4	15,253	62·9	10,810	66·2	25,988	64·4

Note 1.—Conception rate for Carmarthen for the period October to December is based upon the main centre figure only.
Note 2.—Conception rate figures for the quarter January to March for Sturminster Newton have not been calculated, as only 88 inseminations had been performed by the end of March.

As to seasonal variations in conception rate, the results for the quarters ending December and March are seen to be identical (64·4 per cent.). The April to June quarter is below the average (62·9 per cent.) and the July to September quarter (66·2 per cent.) is above it. The trend is seen more clearly in the conception rates for each month of the year for the Cheswardine main centre:—

* The conception rate is the percentage of cows inseminated for the first time which are assumed to be in calf if they have not returned to service after an interval of three months, *e.g.*, a conception rate of 65 per cent. means that, out of 100 cows inseminated for the first time, 65 appear to have been got in calf. First inseminations only are used since, the second and third inseminations being free, the member is likely to notify a return to the first but may not do so when he has to pay again.

Month	Number of insemina-tions	Concep-tion rate %	Month	Number of insemina-tions	Concep-tion rate %
1947—			1947		
January	1,117	67·1	July	787	67·8
February	596	64·6	August	643	70·3
March	564	61·4	September	471	72·8
April	687	61·7	October	507	68·4
May	1,332	63·8	November	953	65·3
June	1,147	66·1	December	2,106	65·4

From these results it is seen that the spring months give the poorest results and the autumn months (August, September and October) the best. The spring of 1947 followed an exceptionally severe winter and cows went out to grass in a very poor state; it may be that the spring conception rates for the current year will not be quite so low. It is, however, interesting to note the peak results in August September for this, for the bovine in the wild state, would be the natural breeding season.

(b) Conception Rates by Breed of Bull

Conception rates for each breed of bull for which more than 1,000 inseminations were carried out during the year are given in Table VI:—

TABLE VI

CONCEPTION RATES BY BREED
(January to December, 1947)

Breed	Total new inseminations	Conception rate
Shorthorn ..	23,180	66·0
Friesian	26,486	64·4
Ayrshire	7,049	61·4
Guernsey ..	2,707	61·1
Jersey	1,393	63·3
Beef	1,057	67·8

The Shorthorn and Friesian breeds, on 23,180 and 26,486 inseminations respectively, have conception rates of 66 per cent. and 64·4 per cent. From inseminations by Ayrshire bulls, 7,049 in number, the conception rate is 61·4 per cent.; this lower figure is thought to be due to a lower level of fertility both in the team of Ayrshire bulls and in the herds using them at one centre and more extensive results for the breed at this and other centres during the current year will throw more light on the point.

(c) Conception Rate by Age of Bull

In the 1947 report the number of bulls in each age group was small and the effect of age on conception rate could not be seen. Large numbers are now available (Table VII) especially for the groups between the ages of one and eight years. It will be seen that in this range the 86 bulls aged one to five years give a conception rate at or above the average, while the 39 bulls aged six to eight years are slightly below the average. If this position is substantiated by further results, it will mean that the genetic advantage of insemination by proved bulls may be accompanied by a slight delay in getting the cows in calf to them.

TABLE VII

CONCEPTION RATE BY AGE OF BULL

Age	Number of bulls	New insemina-tions	Pregnant	Concep-tion rate
				%
Under 1 year	9	525	328	62·5
1 year and under 2 years ..	34	9,774	6,270	64·1
2 years and under 3 years	19	11,155	7,461	66·9
3 years and under 4 years	21	6,460	4,225	65·4
4 years and under 5 years	12	8,936	5,850	65·5
5 years and under 6 years	12	7,668	4,708	61·4
6 years and under 7 years	15	11,018	7,021	63·7
7 years and under 8 years	10	5,480	3,494	62·1
8 years and under 9 years	1	631	378	59·9
11 years and under 12 years	1	73	35	47·9
Beef		1,057	717	67·8
Birth date unknown (imported semen)		718	483	67·3
	134	63,495	40,880	64·4

Age of bulls as at June 30th, 1947

(d) Conception Rates Within Herds

It has been mentioned before that one of the advantages of the A.I. technique is the fact that, having a control on the fertility of the bull, the level of fertility of the cows being inseminated can more readily be assessed. Undoubtedly there are considerable differences between herds and the existence of a low level of fertility within a herd cannot always be diagnosed clinically. The herd conception rate is, therefore, a most useful pointer. If the "herd" is very small the response of a single cow or the chance of success of a single insemination is, of course, considerable; to minimise this effect "within herd" fertility studies have been confined to herds in which ten or more cows were inseminated during the year. Table VIII gives the result, together with a comparison for the previous year:—

TABLE VIII

CONCEPTION RATES WITHIN HERDS OF 10 OR MORE COWS

Herds with initial conception rate of	1947–48		1946–47	
	Number of herds	%	Number of herds	%
Under 25%	21	1·2	5	1·1
25% and under 50% ..	3 6	16·6	88	19·7
50% and under 75% ..	1,101	59·7	259	57·9
75% and under 100% ..	393	21·3	88	19·7
100%	22	1·2	7	1·6
Total	1,843	100·0	447	100·0

It is seen that 60 per cent. of the herds have a conception rate between 50 per cent. and 75 and that 21 per cent. are between 75 per cent. and 100. It is also to be noted that nearly 18 herds in every 100 have a conception rate of less than 50 per cent.; this is a rough measure of the problem of low herd fertility. The very satisfactory conception rate in the Carmarthen area has already been referred to (6a) and in this herd analysis the effect of the high average conception rate for the centre is reflected in a higher "within herd" result; 56 per cent. of the herds are between c.r. 50 and 75 per cent. and 39 per cent. between 75 and 100 per cent. Only six herds in each 100 are below 50 per cent.

7. MANAGEMENT FACTORS

(a) Financal Result

As is known, the Government assists the national development of A.I. by covering any financial losses in operations until 1950. The overall Board A.I. centre account for the year ending March, 1948, shows a small profit of £661 compared with a loss for the previous year of £10,348. This is a gratifying result, but it is too early to forecast the position in 1949 or 1950, for the Board's programme of development is still far from complete and is affected by rising costs and building delays.

(b) Inseminations per Bull

The average number of first inseminations per bull for the year under review is 975. For the previous year the number was 572. This increase indicates (*a*) the greater dilution of semen now carried out (without, be it noted, any reduction in conception rate) and (*b*) the greater use, with the increasing number of cows entered, that may be made of each bull. The largest number of inseminations for one bull was 2,785; there were five bulls used to inseminate more than 2,000 cows each and 24 for more than 1,000 cows.

(c) Inseminations per Inseminator

The team average for eight established centres varies between 1,078 per man (Torrington) and 1,687 (Cheswardine). This is the number of first inseminations for "paid" cows; the total number of inseminations, including repeats, varies between 1,669 and 2,473 per man. As is to be expected there is a correlation between these facts and the density of cows in the area. Since the number of staff has been expanding rapidly during the year and since men have been taken on in advance of anticipated business, it is possible that the numbers may yet be exceeded.

(d) Bull-keep

The cost of bull-keep (excluding straw) has risen during the year; this is mainly due to the high prices that have had to be paid for hay and roots in a year in which such feeding-stuffs have been very scarce. The cost per bull is between £75 and £85 compared with £69 to £65 in the previous year. The quality of the ration fed has been and is being assisted greatly by an adequate supply of dried grass now available to each centre from the Board's co-operative grass-drying centres.

8. Staff

The staff position at the beginning and end of the year is as follows:—

Date	Veterinary Surgeons	Inseminators	Stockmen
April 1st, 1947	7	36	7
March 31st, 1948	9	129	16

Excepting additions to staff, there have been no changes in veterinary personnel; the following are the veterinary surgeons in charge of centres:—

Beccles—G. F. Smith, M.R.C.V.S.; Little Horwood—W. K. Hunter, M.R.C.V.S.; Cheswardine, Welshpool and Tarporley—K. O'Sullivan, M.R.C.V.S., M. M. Murchison, M.R.C.V.S. (Assistant); Shincliffe—B. M. Kerruish, M.R.C.V.S.; Carmarthen—J. Smith, M.R.C.V.S.; Torrington—E. J. Simmons, M.R.C.V.S.; *Frant**—J. A. O'Neil, M.R.C.V.S.; Sturminster Newton, Chippenham—A. Jack, M.R.C.V.S.

*S. I. Hignett, B.SC., M.R.C.V.S., of the Wellcome Veterinary Research Station, acts in a supervisory capacity.

The number of inseminators continues to increase rapidly and among them there have been only two resignations during the year.

Veterinary Officers are to be congratulated on the initiative they have shown in developing new areas; it is true to say that all members of the staff have continued to show a great enthusiasm for their work.

9. The Bull Position

(*a*) *Numbers in Use*

The following list summarises the changes in the numbers of bulls standing at Board centres at the beginning and end of the year. (The appendix which follows this section gives the name of each bull and its sire and dam, together with the name of the breeder.)

Breed	Number of bulls	Breed	Number of bulls
Ayrshire	20 (7)*	Welsh Black ..	2 (–)
Devon	2 (1)	Aberdeen Angus ..	4 (–)
Friesian	50 (22)	Hereford	15 (–)
Guernsey	9 (3)		
Jersey	9 (3)	Total	182 (69)
Red Poll	2 (1)		
Shorthorn	69 (32)		

* Figure in brackets is number at start of year.

(*b*) *Selection of Bulls and Pedigree Analyses*

A gratifying development of the year is the increase in the number of bulls which have been found by the Board's A.I. centre Advisory Committees. This is particularly marked where centres have become well established and it is clear that committees are out to see that the best possible bulls are secured for their members. That the standards continue to be high is shown by the pedigree analysis in Table IX.

It is clear that the A.I. movement is to benefit greatly from the creation of the Bureau of Records. In the Bureau's First Annual Report,* for example, the fact is stated that for the period April to December, 1947, 13,649 records for some 327 bulls were extracted to complete pedigrees of bulls put on offer to the Board. (Out of this number of bulls 51 were selected.) The Bureau is now well forward with its plans for progeny testing and it is hoped, in the next A.I. Annual Report, to feature this most important aspect of the work and to analyse the performances of the A.I. progeny now coming into milk.

* An extended notice of this Report will appear in our next issue.

(*c*) *Calf Marking and the Progeny Test*

To get extensive progeny tests on A.I. bulls, the first step is to secure adequate calf identification. A special A.I. calf-marking scheme would be costly and would only add to the confusion that already exists as a result of the use of many different calf-marking systems. In addition it is only in recorded herds that progeny records will be obtained and the marking of all A.I. calves would not alter the position. For this reason special attention is being paid to A.I. users who record in National Milk Records, for the latter gives a free calf-marking service and the marking system used is the basis of the progeny-testing section of the Bureau of Records.

A complete cross-reference of A.I./N.M.R. membership has been made and gives the following result:—

Table X

Proportion of A.I. Members Recording Officially as at March 31st, 1948

Centre area	A.I. membership	A.I. members in N.M.R.	Proportion per cent.
Beccles	1,525	249	16·3
Little Horwood ..	1,465	207	14·1
Cheswardine ..	2,269	297	13·1
Shincliffe	1,391	75	5·4
Carmarthen ..	2,122	256	12·1
Torrington	1,173	103	8·8
Frant	1,079	238	22·1
Sturminster Newton	694	109	15·7
Welshpool	633	72	11·4
Tarporley	352	37	10·5
Chippenham ..	63	21	33·3
	12,766	1,664	13·0

On an average there are 13 A.I. users out of each 100 members who are members of N.M.R. Among the older centres the proportion varies between 22 (Frant: S.E. Region) and 5½ (Shincliffe: Northern Region). It is known that not all N.M.R. members make use of the free calf-marking service and an effort is now being made, by co-operation between the A.I. centre and the N.M.R. office, to extend the service. In the first area to be tackled—Carmarthen, S. Wales—the result is very satisfactory; 100 per cent. of the centre's A.I. membership who are in N.M.R. have arranged to have their calves earmarked at birth.

We are interested, too, in the progeny performance of bulls that have been used in private herds before being selected for A.I. In some cases they can be traced through N.M.R. but in others the identification of progeny is possible only with the co-operation of breeders and their Breed Societies. It is a pleasure to report that this co-operation is being secured.

Joseph Edwards.

Production Division,
Milk Marketing Board,
Thames Ditton, Surrey,
England.

Table IX

Pedigree Summary of M.M.B. Bulls' Dams (March, 1948)

Breed	Ancestor	Average of highest lactations: Number of lactations	Milk yield lb.	Days in milk	% fat	Average of all lactations: Number of lactations	Milk yield lb.	Days in milk	% fat
Shorthorn	Dams	69	11,120	311	3·79	4	9,505	3 2	3·77
	Sire's dams ..	69	11,255	315	3·73	5	9,739	3?6	3·69
	Dam's dams ..	67	9,887	317	3·71	3	9,113	304	3·66
Friesian	Dams	50	14,750	351	3·75	4	12,430	334	3·72
	Sire's dams ..	50	15,938	346	3·90	4	12,861	331	3·83
	Dam's dams ..	48	15,261	353	3·61	4	12,918	343	3·49
Ayrshire	Dams	20	12,583	341	4·05	4	10,669	317	4·04
	Sire's dams ..	20	13,173	330	4·59	5	10,584	3?4	4·41
	Dam's dams ..	20	11,187	344	3·94	4	10,077	324	4·05
Guernsey	Dams	9	11,839	359	4·67	4	10,116	342	4·90
	Sire's dams ..	9	12,290	352	4·97	4	10,537	346	4·65
	Dam's dams ..	8	10,140	345	4·96	3	7,916	286	4·94
Jersey	Dams	9	11,415	339	4·91	4	10,161	334	5·18
	Sire's dams ..	8	11,517	332	4·97	3	11,077	332	4·83
	Dam's dams ..	6	11,085	322	5·46	2	10,?67	32?	5·27

Animal Health Trust Luncheon

The Process of Development

As briefly recorded in our issue of October 23rd, the meeting of Council of the Animal Health Trust at which was presented the second annual report (shortly to be reviewed in these columns) was preceded by a luncheon, at which the large company was representative of agriculture, thoroughbred horse and stock breeders and owners, and leaders in the canine and poultry world.

The function was held at the Café Royal, W.1, on Wednesday, October 20th, when the President of the Trust, His Grace the Duke of Norfolk, in the chair, was supported, amongst others, by Lord Brocket, Lord Cadman, Lord Stamp, Sir Alan Garrett Anderson, Sir Thomas Baxter, Sir Patrick Gower, Sir Patrick Hannon, Sir Percy Lister, Sir Frank Newson-Smith and Mr. James Turner, President of the N.F.U. Dr. R. F. Montgomerie, President of the N.V.M.A., was present.

Following the honouring of the Loyal Toast, the Duke of Norfolk welcomed the assembly, taking the opportunity of thanking them for the interest and support they had manifested in the Animal Health Trust by accepting their invitation. He would also like to express in front of their guests, his own thanks as President to those who had worked and were working for the Trust because, although he himself had done very little, a great deal—as he hoped to show them—had, in fact, taken place. Dr. Wooldridge, Sir Cleveland Fyfe, Professor Miller and many others there had all worked nobly for the same cause. (Applause.)

They were there that afternoon because they were of the opinion that the importance of veterinary science and the profession had never been put before the people of this country in any way comparable with that of human health. We prided ourselves on being, as he understood it, a nation of animal lovers, and it was right that we should be, because the population of animals in this country was as numerous as the human population. It was quite certain, however, that the great majority of our people did not realise the urgent call which existed for effective action to raise the standards of health of all species of animals, farm and domesticated.

The reason for that state of affairs was not far to seek. In the case of the human population, the reports of the Ministry of Health and the Registrar-General had provided year by year a wealth of statistical information whereby could be assessed the measure of progress made in controlling the incidence of all the main diseases which afflicted us. In the animal world, he regretted to tell them, there were no such reports, and they—or the average citizen in this country—merely read in some corner of the papers that an outbreak of foot-and-mouth disease, or canine distemper, or whatever might be happening at that moment, had taken place, and they turned over the page and looked for other things, thinking everything was in hand and all was well. Unfortunately, that was not the case. The needs of veterinary medicine had never attracted the same public attention as had been given to the needs of human medicine and, consequently, they had never been the object of benefactions designed to stimulate the educational training and research work which is essential to scientific progress in the veterinary field.

It was not until just before the second World War that the National Veterinary Medical Association made an attempt to compile estimates of what some of the principal diseases of farm livestock were costing the nation. The figures were so staggering that leading veterinarians and representatives of livestock interests got together to discuss what could be done to cope with the situation: among others, they approached him. These discussions led to the establishment in 1942 of the Veterinary Educational Trust—by which name the Animal Health Trust was originally known.

That was six years ago and it was, he was afraid, quite certain that during the intervening years not a scrap of evidence had been forthcoming to suggest that losses from animal diseases had declined. In fact, if one took the value of money and the increase in price levels to-day, the pre-war total monetary loss had been virtually doubled and must now be assessed at 60 million pounds each year at least: he had been asked to underline that terrible figure.

He was not going to trespass upon their time by recounting all that had been done since the War ended to carry out the Trust's programme. He did not think that anyone could accuse them of letting the grass grow under their feet. Thanks to generous help from the bloodstock industry, their Equine Research Station was not only in being, but had published its first Progress Report. Equally generous help had come from the dog world and, as a result, the Trust's Canine Station commenced its work during the past year.

His main concern that day, however, was to invite their backing for their plans for farm livestock. With the support of all the political parties, livestock production had become "Priority No. 1" in our national agricultural policy, and, therefore, the foundation of our agricultural prosperity. If, then, the industry was to be healthy and prosperous, it was obvious that it had become a matter of the greatest urgency that the Animal Health Trust should press on with its work to reduce to the utmost possible extent the mischief done by animal diseases.

That was why the Council of the Trust approved proposals some twelve months ago for purchasing a 900 acre estate in Huntingdonshire on which to establish a group of Research Stations to deal with farm livestock problems. Already they had a Poultry Station in being and it would be followed, as rapidly as possible, by the opening of Stations to deal with the ailments of beef and dairy cattle, sheep, pigs, and so on.

They had to borrow the money required to purchase that estate and substantial sums would be needed to adapt and equip the buildings, to stock the land, and to secure the necessary scientific and lay staff. He shared the view of his colleagues that they were justified in going ahead with their plans for the reasons, as he had said, that the need for reducing disease losses was a matter of the greatest urgency. They took their decision in the confident belief that livestock owners would give them their support, individually and collectively.

During the War years it was his privilege to preside over the activities of the Red Cross Agriculture Fund. That Fund, with the invaluable aid of its County Committees, raised many millions of pounds as the industry's contribution to the work of the Red Cross and St. John Organisation. All sections of agriculture and kindred trades and industries rallied to the cause. To-day, he was appealing to the farming and allied industries to make the cause of Animal Health their own, and to do so in the sure and certain knowledge that the money spent in supporting the educational and research activities of the Animal Health Trust would be repaid handsomely by the higher health standards of our livestock, by increased volume of production of meat and livestock products, by raising the numbers and quality of stock available for export markets, and by enhancing the productivity of our soil.

To put it bluntly, theirs was a self-help movement. They aimed at lifting the standard of attainment of veterinary research workers and specialists and to create in their Research Stations that atmosphere which would attract workers of the highest calibre and promote the achievement of scientific progress both by individual effort and by team-work.

He was not asking the industry to raise for this work the enormous sums which were secured for the Red Cross Agriculture Fund, but, in order to repay borrowed money and to provide for equipment and maintenance charges, the Trust's income must be raised by £150,000 annually over its present figure, so that the work of their Farm Livestock Stations could go ahead. It was a very small sum in comparison with the scores of millions of pounds which livestock farmers lost every year through the incidence of disease in their flocks and herds.

Their programme had the cordial support of the leading agricultural organisations, including the Royal Agricultural Society, the National Farmers' Union—whose President was with them and whom he would ask to say a few words—the Milk Marketing Board, and others, as well as the endorsement of the Ministry of Agriculture and the Agricultural Research Council.

He had no hesitation, therefore, in asking for the help of all present in recruiting support for this great movement. That little function had brought together a representative gathering of men connected, not only with the livestock industry, and its great breed societies, but with the trades and industries whose fortunes were closely linked with the well-being of that industry. That circumstance encouraged him to suggest to them that the success of the work of the Trust's Farm Livestock Stations could best be secured and speeded up if the various interests represented there that day would get together, *each in its own group*, and assume a definite responsibility for helping the activities of the Stations individually. The Poultry Station, as he had said, was in being and the poultry industry had pledged its support. What was wanted was organised action by those interested in cattle, in sheep, in pigs, to identify themselves with the activities of the Stations which would be opened as speedily as possible to deal with the problems of these animals.

The Trust's Scientific Director, Dr. Wooldridge, and his colleagues would readily give all possible assistance if the various sectional interests decided to get together, as he had suggested.

and the Trust's County Committees—which would, he hoped, cover the whole of England and Wales in due course—would also back the recruiting drive.

It was only through self-help that we could drastically reduce the enormous cost of disease to the livestock industry. And in helping ourselves we should make a great contribution to the nation's economic recovery, and to improving the dietary of every household in the land. (Applause.)

Mr. James Turner, President of the National Farmers' Union, congratulated the President, the Scientific Director and the Organising Secretary, particularly, on having got together so representative a company of animal lovers and those who were conscious of the vital interests of animal health.

On behalf of his organisation, representing farmers as a whole, he would say that they recognised that to have a negative policy with regard to animal health was no good at all: they had to think in terms of a positive policy and that was what the Animal Health Trust set out to do—to have a positive policy with regard to animal health rather than mere disease. He was perfectly certain that the Agricultural Research Council itself would say "all power to any body of people who are prepared by their own efforts to improve the situation with regard to animal disease"—with the prerequisite that there must be the greatest possible cohesion between the research work of both institutions.

They were embarking on a rehabilitation programme for the livestock of this country, once the pride of England. The basis of our agricultural prosperity in the future must rest on the livestock industry itself, so they must take every possible precaution to see that the industry was not mutilated by the ravages of disease. (Hear, hear.) He commended to them one of the objectives of the Trust, which was to increase the number of persons who were capable of undertaking fundamental research into animal disease: the Animal Health Trust, through its studentships, training scholarships and research fellowships was going to augment them.

Then there was the question of research itself. It was true that the Equine and Canine Research Stations had got a fillip because there were so many horse and dog lovers. But the thing that really mattered was to look at the livestock problem as a whole. That was why he was happy to see there such a representative company of breed society leaders. The N.F.U. were very pleased to see the organisation of county committees and Sir Cleveland Fyfe had done a great deal to engender interest in the working of those committees. (Hear, hear.)

They wanted to make the greatest possible number of people animal disease conscious and the purpose of that function, he presumed, was to interest those present, with a little vigorous prodding, into raising money for the achievement of the objectives of the Trust. He hoped that, as His Grace advised them to do, they would go back to their different parts of the country and think very seriously about the whole problem, and let them see if they could not finance that project in such a way that they did not have perpetually to run to Government resources to achieve results. He did most earnestly commend that project to them because he felt most sincerely that it merited their vigorous support, for the reason that it represented a positive rather than a negative approach to the immensely important problem of overcoming disease amongst livestock. (Applause.)

The President having invited comments or questions on the work of the Trust, Mr. Ronald S. Thomson.* a Kentish farmer, said that he felt that the Animal Health Trust had got to produce some very definite programme of work relating to the diseases of farm livestock, which they could put forward to their counties —otherwise their hopes of raising money amongst farmers would be seriously prejudiced.

Lord Brocket asked two questions: (1) How far did the activities of the Trust apply to Scotland, Wales and Ireland? (2) To what extent were Trust subscriptions out of farming accounts recoverable as expenses against farming profits or losses?

Dr. W. R. Wooldridge, Scientific Director of the Trust, who dealt with these enquiries in the course of his speech, said that he felt that his first duty—a very pleasant one indeed—was to thank His Grace, not only for presiding over the luncheon that day, but—if he might say so, a more important task—for guiding him and his colleagues along the lines of development that were making the Trust's activities of the greatest benefit to the animal owner. His wide experience both in Government circles and in various branches of livestock was of immense value to them and they would like to take that opportunity of stating publicly how much they owed to his guidance. (Applause.)

Proceeding, Dr. Wooldridge said that they had heard that afternoon of the monetary loss to this country of the ravages of disease amongst its livestock, but perhaps it was even more salutary—as it was topical—to look upon this loss in terms of food value. Therefore, he thought it would be instructive to give the most reliable estimates of this annual loss of food arising from disease: 200 million gallons of milk a year; six million full year's rations of meat; more than 2,000 tons of liver and other offal; 38,000 tons of poultry meat, and 1,500 million eggs. Surely, the avoidance of this wastage, or even a material reduction in its value, was something for which we should all strive. There were, of course, many other incidental losses, such as wastage of animal feedingstuffs, the production of inferior by-products, and their effect on such industries as leather and surgical gut, and the great wastage of labour necessary to make good as far as is possible this loss by other means. Should we not attack this problem of animal disease at all levels; provide means for improving our skilled personnel; develop research centres to tackle problems of all species of animal; and create reasonable hospital and specialist services to co-operate with our veterinary practitioners? In short, do all those things for which the Animal Health Trust stands.

He must emphasise, in these days of State aid, that they were an entirely independent organisation: they were independent because they felt very strongly that there was a need for some organisation to take the lead in animal health matters that was given to the medical profession 100 years ago by benefactors who were prepared to give millions of pounds to the medical schools and hospitals. They realised that benefactions on that scale were difficult if not impossible to-day, but it must be emphasised that the Animal Health Trust was dependent entirely upon the support of the animal-owning community, their attendant industries, and the general public. From the outset, the Trust had the courage of its convictions and started its work without an ensured income. Despite the prevalent opinion to-day that the Government had to do everything for the individual, they felt that there was still a need for a vigorous organisation that was prepared to go forward with this pioneer work for the benefit of the animal industry and for the public as a whole. The greatest movements had always begun as voluntary organisations capable of taking risks in proving the need for their work.

He commended to them the perusal of their reports—they now had the Second Report before them—and he ventured to suggest that it would withstand the closest examination. They were all too well aware of the difficulty of getting personnel, buildings, equipment and so on, but he maintained that there was no other organisation in the country that had made such progress as the Animal Health Trust had done in the last few years. (Applause.) They had set up their stations for research into the diseases of horses and dogs and their poultry research station was also now in being, but their plans for developing research stations for farm livestock were being slowed up for lack of that splendid degree of financial support which had characterised the ventures at Newmarket. He would stress, however, that the thing that was most lacking in their organisation, so far as research was concerned, was provision for the animals of the farm other than horses and poultry. As they would appreciate, that was a deficiency it was essential to overcome in the interests of British agriculture. (Hear, hear.)

Turning now to the questions that had been asked, Dr. Wooldridge reminded the company that Mr. Thomson had said that they could expect to get the money from the farmer when they showed him that the Trust really had a plan for livestock research.

They had managed to take Hodge and the dog owner with them as they developed and these groups of animal owners now realised to the full the value of the Trust. These livestock industries were co-operating very well indeed and now knew that the money they provided in the early days was a sound investment. He would deny emphatically any suggestion that the Trust was holding back with its plans for farm stock. They showed they had a plan, for they had bought a research station of 900 acres; they had given several fellowships for research into the diseases of farm livestock; they had sent people to America to gain experience there, and already they had appointed a farm manager and the first scientific worker to the Bovine Research Station. Furthermore he was at the moment arranging for a second eminent research worker to be appointed to the Farm Livestock Research Station. There was, however, at present, a limitation to the rate of the development of this station in that it was not a right thing to ask promising young men, embarking on a research career, to join the Trust, unless they could give them reasonable

*Our readers will have learned, with deep regret, that Mr. Thomson collapsed and died at Olympia, after addressing the annual meeting of the English Guernsey Cattle Society.

assurance in regard to the stability of the positions they took up. These research scientists could only make it their life work if they and the Trust they served could count on the support, not only of the farmer and the breeder, but also of those industries that were in any way dependent upon livestock and their products.

In reply to Lord Brocket, any sum given to the Trust by an individual or a firm gainfully interested in animals or their products could be counted as a legitimate expense against their taxation for the Trust was a recognised research association for the purposes of the Finance Act, 1944. As a charity they could also give it sums under covenant, so that income tax could be reclaimed by the Trust. Furthermore, individuals interested in the Trust's work could leave their money to them, so that their beneficiaries would have a bit less to pay in death duties than if it went to someone else. (Laughter.)

In regard to the geographical scope of the Trust, their Trust Deed was drawn up in such a manner as to enable them to extend their activities anywhere in the world. Already they had important contacts in the United States and had received financial help from Australia, New Zealand, South Africa, India, Southern Ireland and the Argentine. In this connection it might be added that research workers had come to them from several of these countries to gain experience at their research stations—they welcomed some of those workers with them that day. (Hear, hear.) Thus the indications were clearly that they were extending their activities—certainly far beyond the boundaries of Great Britain.

"We realise," said Dr. Wooldridge in conclusion, "that there is a great need for something to be done; we know that in doing things of this character a risk has to be taken, and as an independent organisation we can take risks that Government Departments cannot take. We have taken and are taking those risks and we can promise you that if only you in the livestock industry and others will support us, we can guarantee to give you results out of all proportion to the money that you are proposing to invest in us.

"Your Grace, may I thank you again, Sir, for your able supervision of our activities." (Loud applause.)

IN PARLIAMENT

Pit Ponies (Conditions)

In the debate on the adjournment of the House of Commons on October 27th, Mr. Peter Freeman called attention to the undesirable conditions under which, as he alleged, ponies are worked underground, and urged amendment of the Mines Act to remedy them. These conditions, said Mr. Freeman, were in force in 1911, 37 years ago and no alteration had been made to them since. Thirty-seven years ago these conditions were harsh and difficult. They had got steadily worse apparently by the increased mechanisation of the mines, and by the large number of young miners who chose that vocation as an alternative to going into the Army, and largely by the forced production and increased desire to get a larger quantity of coal.

Under these conditions there was no limit to the time a pony could be worked. He had given one example of 40 per cent. of the ponies working more than one shift. They could be worked seven days a week, 365 days a year, without any rest or holiday or respite of any kind. The reforms which he suggested should be provided immediately for these ponies, and none of which were in operation at present, included provisions that no pony should be allowed to work for more than one shift a day or more than five shifts in a week. No pony should be allowed to work for more than ten years down the mine. He suggested that at least some holiday should be provided each year for these ponies.

There was only one inspector for every 3,000 ponies. He was utterly incapable, therefore, of seeing that every pony received proper attention and careful notice. He suggested that a larger number of inspectors should be provided, and proposed that there should be one inspector for not more than 1,000 ponies. Ponies should be open to inspection not only by their own inspectors who are on the pay roll of the National Coal Board, but by inspectors from the Society for the Prevention of Cruelty to Animals, or the National Equine Defence League, without notice, as was the case at present with any other animal which is suffering in this country. There should be opportunities for a complaint to be made when necessary, and a public inquest in the case of every pony that was killed or died underground, in order to find the reason and to ensure that some remedy was put into operation to avoid a repetition of the accident.

Finally, he suggested that there should be public information given about the condition of the ponies. The provisions imposed in the 1911 Act provided that the owner should give a report every year on the condition and the number of his ponies, their accidents, illnesses and details of the number that died down the mines. In the Reports of the National Coal Board for 1946 and 1947 there was not one word about the condition of ponies or details of any accidents. There was no report whatever of the number of pit ponies down the mines and of their conditions. There were no details of what happens to them, in spite of the provisions to which he had referred. A statement should be made. Within a reasonable time all these ponies should be withdrawn from the mines, and mechanisation should do their work. Within a period of, say, ten years, no pony should be allowed to continue in these undesirable conditions which, at the best, were a hell upon earth.

The Parliamentary Secretary to the Ministry of Fuel and Power (Mr. Robens), in reply, said that, in point of fact, the regulations in the 1911 Act made it clear that, if properly carried out, they should enable all these ponies to be looked after in a careful and fair way.

He assured his hon. Friend and the House that the Ministry which had a special responsibility in this matter, carried that responsibility very seriously and it was in no way second either to his hon. Friend or other hon. Gentlemen who belonged to the various associations in its desire to show kindness to animals and to make sure that pit ponies were not unduly worked or hurt in any way. The treatment of all animals in the country was subject to a special Act—the Protection of Animals Act, 1911. On top of that, the pit ponies had a further protection in the very comprehensive Third Schedule to the Coal Mines Act, 1911. The Ministry of Fuel and Power had seven inspectors of horses in mines who were highly specialised in the subject and devoted the whole of their time to the inspection of horses in mines, while other inspectors devoted a part of their time to such work.

How were they able to look after these horses, and what was the type of supervision? During 1947, the horse inspectors made over 42,000 inspections of horses in the course of 2,130 visits to the pits, so that, in effect, there were two inspections for every horse employed. In addition, if there was a complaint, prompt investigation was made both by the Ministry and by the National Coal Board, and he must say that the bulk of complaints were very often found to be without foundation, while a good many others were quite exaggerated.

"I want to say this to my hon. Friend, who has drawn this horrible picture about ponies in pits," proceeded Mr. Robens, "horses employed below ground to-day are as well treated and cared for as those employed on the surface. That does not mean that there may not be cases, both on the surface and in the mines, where a point could probably be made, but, generally speaking, the ponies underground can be said to be equally well looked after as those on the surface. In my own visits to pits, I take a particular interest to see the conditions under which ponies work, and from my own experience I would say that what I have just stated is the fact. . . . The number of horses employed in mines—and this will be of interest to my hon. Friend, because he was concerned about it—was 63,000 in 1922, but the number fell to 32,000 in 1937, and, by June of 1947, there were 21,200. That decline will go on. There is no question that the number of ponies in pits will decline with the advance of mechanisation of underground transport, and in any case, while there are any horses in mines at all, the Ministry of Fuel and Power and the National Coal Board will not relax their efforts in seeing to their welfare."

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Slaughter of Horses

On the following day, also on the motion for the adjournment, Mr. Sutcliffe drew the attention of the Ministry of Food to the alarming position arising in this country at the present time owing to the ever-increasing slaughter for food of young horses. There had been an enormous growth in this traffic during the last 12 months, and if it was not stopped, there would be a very definite shortage of some of our best-known breeds of horses within a few years. Since January 1st, 1945, we had killed in this country 162,654 horses, in only 24 cities, boroughs and urban districts from which he had been able to obtain figures. He was indebted to the local authorities who had sent him their figures.

Amongst the figures quoted by Mr. Sutcliffe were the following, from West Ham: in 1945, 14,300 horses were slaughtered, and in 1947, 19,200. For the first nine months of this year the figure was 14,239. The public had no idea of the extent or ramifications of this trade; if they had, they would rise in their wrath and demand that action be taken to stop it. The vast majority of these horses were young ones in the prime of life, perfectly healthy and with

many years of useful service before them. In fact, they represented some of the finest types of British horses of all kinds, including quite a number of prize winners at the shows, which went straight from the market to the slaughterhouse. In a number of cases they even included mares with their foals, yearlings, two-year-olds and, indeed, horses of all ages and all kinds. The two main breeds affected were the Shires and Clydesdales. If this practice was continued, the virtual extinction of two of our finest breeds of working horses would be brought about. No horse was safe at sales to-day; each animal was looked at from the butcher's angle. From 80 per cent. to 90 per cent. of the meat was destined for London, and in the transactions carried out by these men payment was in cash with no questions asked.

Dr. Summerskill, Parliamentary Secretary, Ministry of Food, said that because her department fixed maximum prices they might be indirectly responsible for the illicit market in horseflesh, but they had the utmost difficulty to persuade witnesses to come forward to give evidence against these people.

An Order would take effect on December 19th under which those who owned knackers' yards would not only have to obtain a licence from the local authority but from the department. They would have to keep records as to the source of their meat and the number of animals slaughtered, but the slaughter of horses by farmers or their agents could not be controlled.

NOTES AND NEWS

Diary of Events

Nov. 9th.—Scientific Meeting of the Zoological Society of London, Regent's Park, N.W., 5 p.m.

Nov. 10th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, London, W.C.1, 2.30 p.m.

Nov. 10th.—Royal Sanitary Institute, Benjamin Ward Richardson Lecture: "Science in the Imported Meat Industry" (E. H. Callow, B.SC., PH.D., F.R.I.C., and W. Ingram, M.A., PH.D.). At 90, Buckingham Palace Road, S.W.1, 2.30 p.m.

Nov. 12th.—Meeting of the Southern Counties Division, N.V.M.A., at Southampton (University College), 2.15 p.m.

Nov. 13th.—Annual Meeting of the Society of Women Veterinary Surgeons, at the Conway Hall, Red Lion Square, London, W.C.1, 2 p.m.

Nov. 16th.—Annual Meeting of the Scottish Branch, N.V.M.A., at Edinburgh (Royal "Dick" Veterinary College), 2.30 p.m.

Nov. 19th.—Annual Meeting of the North Wales Division, N.V.M.A., at Ruthin (Council Chambers), 2.15 p.m.

Nov. 24th.—Meeting of the Lancashire Division, N.V.M.A., at Liverpool (The Veterinary Hospital, Pembroke Gardens), 2.30 p.m.

Nov. 25th.—Meeting of the South-Eastern Division, N.V.M.A., at Tunbridge Wells (Royal Mount Ephraim Hotel), 2.30 p.m.

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The N.V.M.A. Grassland Conference

When Mr. Pool first put forward the idea of holding a Grassland Conference, many people felt that the gaps in our knowledge were too large for the project to succeed. It was hoped that we should gain much valuable information from the chemists and agronomists, but it was feared that our own contribution would be a rather scantily clad skeleton, which would demonstrate to us little more than where gaps had to be made good. Events proved otherwise, however, and the Conference closed after a second stimulating day in which much latent knowledge had been revealed and in which discussion was limited by time alone.

There is no doubt that the Conference, the first of its kind, was a great success. Over 300 people attended each day, and it was sometimes necessary to place additional chairs in the gangways. The tempo of the Conference was mostly brisk and lively, and the President, Dr. R. F. Montgomerie, had an exacting task—which he most ably performed—in compressing the addresses and discussions into the official time-table.

The papers and the discussion will be available in printed form at a later date. Meanwhile, mention should be made of some of the outstanding features. Among these we must include the most interesting and forceful way in which Mr. W. D. Hay presented the case for grassland development, the address of Sir George Stapledon which was a delight to all who heard him, and the valuable contribution made, with refreshing humour, by that shrewd farmer, Mr. W. Alexander.

Special mention must be made of the opening paper, on the second day, by Mr. G. N. Gould, of Mr. D. H. Curnow's paper on the Oestrogenic Factor in Subterranean Clover in Australia and of Mr. Ferguson's work at Jealott's Hill. Dr. E. L. Taylor and Dr. H. H. Green and Mr. W. R. Muir all made most interesting contributions, while Captain J. R. Barker and Mr. A. Messervy showed, unwittingly, to what a very high standard clinical veterinary medicine can be raised. Dr. W. R. Wooldridge focused attention on the cell and its enzymes, and Dr. W. S. Gordon dealt with grass sickness.

Messrs. Burroughs Wellcome provided excellent refreshments, and did so in a manner which enabled over 300 people to enjoy them within the allotted space of fifteen minutes. For this and the use of their lecture theatre, and all the preparations involved, the N.V.M.A. is much indebted, as Mr. J. W. Bruford indicated when he moved a vote of thanks.

The Conference afforded an excellent opportunity for veterinarians—both research workers and what we must now call "those engaged in general practice"—to listen to experts in the various branches of agricultural science, and to exchange points of view. What Mr. Guy Anderson had advocated during his year of office as President was thus put into practice, and it seemed to be the general opinion that a healthy precedent had been established, and that further conferences of this nature should be held in the future; though not, if possible, to clash with the Dairy Show.

The Association is most grateful to the guest speakers, who not merely contributed so greatly to the success of the Conference, but made it possible in the first place.

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The Dairy Show

The Animal Health Trust was unfortunate in having its stand placed in an out-of-the-way and draughty corner. Nevertheless, once found its slick décor in green and white held one's attention. The stand was smaller, simpler, and the exhibit more uniform than that at the York Show. The idea of having a counter at the back for a demonstration of certain laboratory techniques was again adopted with success; and in the foreground slowly revolving panels gave facts and figures concerning, amongst other things, veterinary achievement in the treatment of milk fever and the Trust's research activities. It can certainly be said that the Trust spoke for the profession as well as for itself.

The Ministry of Agriculture staged an excellent exhibit dealing with infertility, mastitis and contagious abortion. The section dealing with infertility was divided into three parts—"infertility at conception" due to such causes as diseased ovaries or defective semen; "infertility during pregnancy" due to trichomoniasis and contagious abortion; and infertility resulting from infected hands or appliances used on a cow at calving, and tuberculous metritis.

The section on mastitis showed very clearly the results of an experiment in which 18 cows were milked with hands contaminated by *Str. agalactiae*, and the effect of penicillin treatment and disinfection subsequently. Another diagrammatic representation concerned the use of penicillin in ten herds, numbering 424 cows, last year.

The section on contagious abortion explained the various modes of infection, and showed that of every ten unvaccinated animals experimentally infected, only two produced live calves; whereas of every ten vaccinated animals, deliberately infected, nine had live calves.

In arranging exhibits of this sort, which come under the heading of Visual Education, there is always the danger, in arresting a person's attention, of creating an appetite for facts without assuaging it. On the other hand, there is the danger of surfeiting the mind with an excess of facts or statistics. It seemed to us that the Ministry successfully achieved a balance between the two. And there is no doubt that the occasional pathological specimen, or a representation of highly magnified and stained bacteria, will retain a person's interest where a mere display of posters completely fails.

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PERSONAL

Births.—Gledhill.—On October 19th, 1948, to Joan (*née* Egan) wife of G. G. Gledhill, M.R.C.V.S., of 116, Broadoak Road, Ashton-u-Lyne—a daughter, Susan.

Wooldridge.—To Constance and Dick Wooldridge, 4, Bridge Street, Stratford-on-Avon, on October 31st, 1948—a son.

EDINBURGH UNIVERSITY DEGREE IN VETERINARY SCIENCE

At a Graduation Ceremonial of the University of Edinburgh held on Saturday, October 23rd, the following students of the Royal (Dick) Veterinary College graduated B.Sc. in Veterinary Science: Blythman, William Grant; Caird, Elizabeth Aytoun Young; Head, Kenneth William; Huddart, James Eric; Kydd, William John Colman; Malloch, Robert Alexander Hope Wann; Moodie, Edwin William; Moore, Edward Russell; Phillips, James Edwin; Rafferty, George Campbell; Richardson, Sydney; Riddell-Swan, John Morrison; Steele-Bodger, Alasdair, B.A. (CANTAB.); Stockdale, Henry Graham; Tench, Alan Howard, and Thomlinson, John Reay.

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INSTITUTE FOR THE STUDY OF ANIMAL BEHAVIOUR

Dr. W. H. Thorpe Elected President

At the Annual General Meeting of the Institute for the Study of Animal Behaviour, held on October 10th, 1948, in the rooms of the Linnean Society, Dr. W. H. Thorpe, of the Department of Zoology, Cambridge, was elected President in succession to Professor Edward Hindle. Dr. Thorpe, who is a leading British worker in the field of animal behaviour, is a member of the editorial board of *Behaviour*, the new International journal devoted to this subject.

Dr. P. H. T. Hartley, of the Edward Grey Institute, Oxford, was elected joint honorary secretary with Professor Alastair N. Worden, while Mr. James Fisher, a former honorary secretary, was elected honorary treasurer.

The following were elected to serve as members of Council: Mr. R. J. Bartlett (London); Dr. J. T. Edwards (London); Dr. John Hammond (Cambridge); Professor A. C. Hardy (Oxford); Professor Edward Hindle (London); Professor Julian Huxley (UNESCO); Dr. E. S. Russell (Hastings); Dr. Arthur Walton (Cambridge); and Dr. C. W. M. Whitty (Oxford).

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"The Veterinary Surgeon and the Dairy Herd"

Some of the problems which the agriculturist and the veterinary practitioner have jointly to face on the farm if the modern policy for positive animal health in our dairy herds is to have hope of success, were dealt with by Mr. G. N. Gould, M.R.C.V.S., of Southampton, Hon. Secretary of the National Veterinary Medical Association, in his address to the Farmers' Club on Monday, November 1st.

Mr. Gould, at the outset, reviewed the steps taken by the N.V.M.A., through its Survey Committee, to ascertain the incidence and consequent financial loss, of the major diseases of our dairy herds, as a prelude to the introduction of the control scheme, of which the Association, the N.F.U. and the Ministry of Agriculture were the sponsors. Beneficial consequences of the operation of the scheme included an unprecedented advance in the application of veterinary science on the farm, the stimulation of research into the everyday problems of the dairy herd, and willing co-operation between the farmer and the veterinary surgeon in the control and eradication of disease.

The N.V.M.A. undertook the responsibility of disseminating new information as soon as it became available. "It is not generally appreciated," said Mr. Gould, "how rapidly the veterinary surgeons in the field absorb and apply the fruits of research work—notably in respect of new therapeutic agents."

Contagious Abortion

The initial reports of the Survey Committee on contagious abortion demanded a vaccine that must be of standardised dosage from a strain of attenuated organisms which did not mutate, but which would give a high degree of resistance. The American Strain 19 vaccine, which has these qualities, was now in production at Weybridge and had proved of enormous value in the control of the disease: the claim of about 97 per cent. efficiency was, in his experience, well substantiated, particularly as it had been used, in the main, without any prior blood testing to determine whether or not the animal was already infected. He had never known vaccination have a deleterious effect on fertility, while he had been greatly impressed with the great reduction in infertility in infected herds following control by vaccination—largely due, in his view, to the removal by vaccination of one of the chief contributory causes of inflammatory conditions affecting the uterus, infection with *Brucella abortus*. A contagious abortion vaccination policy was an integral part of good herd management.

The emphasis on winter milk had led to an alteration in our views regarding bull fertility, and it was recognised that phases of high and low fertility—and occasionally sterility—of the bull occurred and depended to a considerable extent on management and nutrition. There was great need for intensified research into infertility, using bovines as the subject; in the meatime, venereal types of infection responsible for a high degree of infertility were well recognised and lent themselves to control measures.

Mastitis

It was estimated that 30 per cent. of cows harboured contagious streptococcal mastitis organisms in the udder and were potential clinical cases when contributory or exciting causes became operative. Sulphanilamide, originally recommended by the Survey Committee as the best therapeutic agent available at that time, and still a useful measure if used rationally, had been superseded by penicillin used as an udder injection. Spectacular results had been achieved both in treatment and control and in herd eradication, with the rehabilitation of udder tissue and recovery of function, but over-publicity, inducing neglect of attention to contributory causes, might lead to disappointment and loss of repute of this product. In his opinion, mastitis remained essentially a disease of faulty management and milking methods. Mr. Gould then proceeded to describe a system of dairy hygiene based on efficient rapid milking, elaborated by Professor Petersen, the elimination of hand stripping in machine-milked herds and the use of a sterile cloth for each individual cow. New therapeutic methods, added the speaker, were still coming forward for the treatment of streptococcal and other forms of mastitis.

Johne's disease, as indicated both by his own experience and by enquiry directed towards testing the efficiency of a method of laboratory diagnosis, was probably far more prevalent than was generally realised. It appeared that infection took place in early life and that in infected herds the disease should be controlled by the weaning of the calf at birth, the cleansing of the udder prior to milking out of the colostrum or milk for feeding the calf, and the strict segregation of the calves from the adult stock or from pastures grazed by the adult stock, until they were at least 12 months old.

Breeding Policy

Turning to breeding policy, Mr. Gould said that this had a distinct place in long-term measures for animal health. Practically every livestock owner was aware of the great influence of the bull, and it was nonsense for some of the exponents of the importance of production records, with which he was in full agreement, to claim, as they did, that conformation of the cow was of no particular importance. The rearing of the calf, too, had a vital influence upon its future: here, housing was an important factor.

The absence of oestrus was closely associated with sub-normal nutrition. A modified "steaming-up" process in the last six to eight weeks of gestation could be of great benefit at a most important time in the development of the calf and of the dam's udder.

Tuberculosis

Mr. Gould then proceeded to deal with the problem of parasitism, on lines which will be fully ventilated in these columns in association with the N.V.M.A. Conference on Grassland and Animal Health, and had some words to say on "the greatest problem of the immediate future"—the application of a scheme for the eradication of tuberculosis from our dairy herds. The profession and the livestock industry had been patiently awaiting the Ministry's scheme; in his opinion, a really comprehensive scheme would achieve eradication in twelve to 15 years. In the meantime, there should be the greatest possible extension of the attested herd scheme, in which the veterinary surgeon, in his frequent contact with the farmer, did much to help. An efficient diagnostic agent was available in tuberculin, and he was strongly in favour of an increased financial incentive for those who voluntarily undertook eradication. In some areas progress was impeded by too expensive demands by licensing authorities: it must be remembered that eradication could be successfully accomplished in buildings which would not satisfy all of these.

Reaching Maximum Production

"The part played by disease," said Mr. Gould in conclusion, "is made clear from the report of the Economic Advisory Council of 1934, in which it is stated that 'the milking life of the dairy cow is only half that which might be expected under ideal conditions' and, later, 'that 58 per cent. of the cows passing out of herds are disposed of on account of disease, and the loss of the remainder is indirectly attributable to disease.'

"In the Bureau of Milk Records Report to the Milk Marketing Board dated September 30th, 1947, it was shown that the average number of times calves of recorded cows was 3·1 and that only

7·2 per cent. of our milk recorded cows reached the most productive period of their lives which was shown to be the seventh lactation.

"I stress therefore that the health of the dairy cow is the primary factor determining production in efficiency. It can be variable in degree without manifestation of disease; variation in the absence of disease is dependent upon environment and especially nutrition and management. Good management implies effective disease control, in the absence of which health and productivity can become remarkably lowered although management may otherwise be of a high standard. Disease appears to be the greatest limiting factor to productivity operating to-day.

"There are those who state that greater productivity will result in greater disease toll, but there appears to be no sound basis for such an argument. Higher production does not mean all thousand-gallon cows—I suggest that as a first objective it means an average annual increase of 50 gallons per cow and, thereafter, a further target. If we consider the average yield of our national dairy herd, the need for such an initial increase is obvious to all. Positive health can bring about prolonged productive life and consequent increased life-time production of milk and calves.

"My theme throughout this paper has been that good management to which the veterinary profession has a contribution to make and the full utilisation of the fruits of scientific endeavour are the key points in a policy for positive animal health in our dairy herds. Co-operation between farmer and veterinary surgeon is the crucial factor. Disease, much of which is preventable or controllable, is the greatest menace to health and efficiency under present-day conditions and, as such, demands the early initiation of a planned, active and progressive disease control policy with definite timed objectives in view."

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TUBERCULOSIS IN DAIRY HERDS

In its leading article on the Dairy show *The Times* commented on the slowness with which, in Great Britain, preventible bovine diseases (which include tuberculosis, mastitis, and contagious abortion), are in fact being prevented, and made special reference to the tardiness of the Government hitherto in implementing their declared policy of "cleaning up" counties as regards tuberculous dairy herds, and the apathy and neglect of a large proportion of our dairy farmers in assisting the process.

This called forth the following comment from Lord Bledisloe: "It is noteworthy that the Royal Agricultural Society of England, besides refusing, as from last year, to admit tuberculous bovines to its great annual show (a policy being followed by all the other leading show-holding societies, including the British Dairy Farmers' Association), initiated three years ago an inter-county dairy herds competition, a challenge trophy being now awarded annually to the county in England or Wales which has decreased to the greatest extent during the previous 12 months the number of its non-attested dairy herds. So far the results of this competition have clearly demonstrated the exceptional and highly commendable effort of Wales (especially South and West Wales) to 'clean up' her herds and to make it a matter of county pride and prestige to do so. Cardigan has just won the trophy for the second year in succession, the decrease in the number of its non-attested dairy herds in the year ended last month being no less than 22·4 per cent.; the next in order being Carmarthen, 16·9 per cent.; Westmorland, 15·4 per cent.; and Cambridgeshire, 12 per cent. The average decrease in the whole of the English counties during this period was 3·3 per cent. and of the Welsh counties 4·2 per cent.

"I cannot help wondering whether the pride of achievement in the production of pure and wholesome milk prevalent in some of the Welsh counties cannot usefully extend to other counties in both England and Wales and, moreover, evoke sufficient interest among their urban milk consumers (who stand most to gain) to stimulate more definite methods of encouragement by urban local authorities within their ambit. Compulsory pasteurisation, however, might prove a deterrent to such identity of aim between town and country.

"Britain's record in respect of bovine tuberculosis is not one on which we can justly pride ourselves. Although comparatively few cows and heifers yield tuberculous milk (quantity is affected more than quality) it is estimated that 40 per cent. are affected with the disease, as compared with ·5 per cent. in the United States, 2 per cent. in Canada, and 4·5 per cent. in New Zealand. The incidence of the disease in Switzerland, the Netherlands, Denmark, Belgium, France, and Britain is said to vary from 20 per cent. to 40 per cent., Britain being at the bottom of the list."

LEGAL NOTES

Care of Whelping Spaniel: Veterinary Surgeon Not Negligent

In a reserved judgment at Bristol County Court, Judge Wethered found for the defendant, Mr. George Ernest Henson, veterinary surgeon, of 19, Richmond Hill, Clifton, in an action brought by Mr. Harold Templar, of 4, Kenmore Road, Knowle West, Bristol, to recover £25 damages for alleged negligence in respect of the care of a pure-bred blue roan spaniel bitch, about to whelp. Mr. Templar's claim was made up of £5 paid to have the bitch serviced, and £20 for the loss of a litter of puppies.

Giving judgment for Mr. Henson, with costs, the Judge made it clear, reports the *Western Daily Press*, that Mr. Henson was not personally involved in the transaction at all, as he was not present when the contract was made. The question was whether his assistant veterinary surgeon, or kennelmaid at that time, were guilty of carelessness. He did not so find.

The circumstances, which, said the Judge, were not in dispute, were that the dog was collected by car on the night of November 13th, 1947, and was in charge of Miss Marjorie Levie, a veterinary surgeon, acting at that time as assistant to Mr. Henson—and Miss Maureen Taylor, an experienced kennelmaid. According to the evidence, a collar, with chain attached, was put on the dog by the plaintiff. The kennelmaid had custody of the dog in the back of the car. When they arrived at the surgery it was dark, and Miss Levie took the extra precaution of putting a second lead round the dog's neck. Miss Taylor held the dog by two leads while Miss Levie unlocked a door, when the dog decided to bolt and disappeared despite a two-hour chase. Messages were put through to the police and the Dogs' Home. The dog returned four days later to Mr. Templar's house without any puppies, although it had whelped.

The Judge recalled that Mr. Henson had said that in the case of a dog two days over its time, 65 days instead of 63, it was almost certain that the puppies would be born dead. From such examination as she had been able to make, Miss Levie thought that the first puppy was probably dead already. The fact that the dog turned up, on November 17th, without puppies, seemed to justify the inference that they were born dead.

He did not think there was any negligence on Miss Taylor's part in the way in which she held the dog. Its escape was an accident that might have happened to anybody. The real trouble was that the collar was insufficiently fixed. In his view, there was no breach of duty by Miss Levie in relying on plaintiff having fixed the collar securely. Mr. Templar had failed to establish any legal liability on the part of Mr. Henson.

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PREGNANCY AND INSEMINATION

In the issue of *The Farmer and Stock-Breeder* of October 20th, Mr. G. N. Gould, M.R.C.V.S., of Southampton, writes: "I was interested in your veterinary surgeon's reply (page 2315, October 5th) in which a cow bought as *not* in-calf was subsequently said by the farmer to be on heat, was inseminated at the farmer's request and subsequently aborted a five months calf. Your veterinary surgeon suggests that the farmer has a grievance, if not a claim against the Centre, which should have diagnosed pregnancy.

"I wish to point out that inseminators cannot be expected to master the intricacies of pregnancy diagnosis and that it is not a part of their duties. The training of inseminators to do this very skilled work would present insuperable difficulties, in the absence of the necessary fundamental training, the knowledge and facilities for acquiring experience of pregnancy at all stages over a long period.

"It is a rule of all centres that cows are inseminated at the request of the farmer who is responsible for determining when they are bulling. If doubt arises regarding normal heat, it is his responsibility to consult his veterinary surgeon prior to requesting insemination."

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PLEA FOR EXTENDED VETERINARY SERVICE IN SOUTH AFRICA

Opening the congress of the women's division of the Transvaal Agricultural Union in Pretoria, Dr. Gilles de Kock, the Director of Veterinary Services, pleaded for an extended State veterinary service which would be entrusted with the maintenance of health of animals and be responsible for the food of the people. He said that most of the graduates of the Onderstepoort Veterinary College and even research workers were leaving the service because better prospects were guaranteed in private practices, in municipalities and in neighbouring States.—*South Africa.*

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible

"THE CLINICAL ANALYSIS OF REPRODUCTIVE FAILURE IN CATTLE"

Sir,—It was not without a sense of gratification that I read the congratulatory sentence with which Mr. Smythe prefaced his comments on my recent paper, but I feel that my indebtedness to Mr. Smythe for this agreeable courtesy should not dissuade me from drawing attention to several points in his letter.

I am at a loss to understand the reasons which prompted Mr. Smythe's exhortation to clinicians to accept my observations on the normal oestrous cycle as being valid for "a wild cow on free range," and his implied suggestion that they may lack validity for the cycle of the cow maintained under conditions of modern husbandry. As I must disclaim any knowledge of the wild cow and persist in my claim to some acquaintance with the farm animal, I would naturally prefer my observations to be read as applying to the latter. With regard to his extensive studies of *post-mortem* material, I would suggest that observations, made on material obtained without complete information on the stage of the cycle at the time of the animal's slaughter, would be of little value in determining the degree of synchronisation between the growth and decline of the corpus luteum and follicular development. If Mr. Smythe's material was recovered at known stages in the cycle then he is undoubtedly in a position to make a unique contribution to our knowledge of the changes in the ovaries of the cyclic cow.

I must admit to having been guilty of some lack of care in stating that regression of the corpus luteum rarely commences "before the 17th day." Bearing in mind the variation in cycle length which may occur in normal cattle I would suggest that this should be altered to read "earlier than 72 hours before the onset of oestrus." I would emphatically disagree with the assertion that maximum development of the corpus luteum is achieved between the twelfth and 14th days and that only at this time can enucleation be effected. Recent observations made at two-day intervals on eleven heifers and covering 50 cycles have indicated that the corpus luteum attains its maximum development about the seventh day and have further confirmed my opinion that it is clinically prominent for approximately twelve days. If Mr. Smythe's assertion were true, the chances of being able to enucleate the body, in any unselected series of animals showing well-defined corpora lutea, would be about one in four. This is so patently contradicted by clinical experience that I must reject the suggestion. Further, the variation in the time elapsing between enucleation and the manifestation of oestrus in cyclic "suboestrus" animals seems, almost certainly, to be due to success in enucleating corpora lutea encountered at different stages of the cycle. I would, however, heartily endorse the suggestion that enucleation should be restricted to the removal of well formed corpora lutea, which in healthy non-pregnant animals, may be assumed to be less than one cycle old. The removal of older corpora lutea has no rational justification except for the termination of pregnancy, the expulsion of a mummified foetus and the evacuation of uterine pus and in these cases is a hazardous operative measure.

Mr. Smythe's suggestion that many follicles may fail to rupture is one which I accept but think it unnecessary to invoke "pituitary dysfunction" to explain this failure. The recent investigations referred to above have, I believe, provided me with convincing clinical confirmation of the occurrence of follicular regression during dioestrus. A similar observation was recorded by Zupp in 1924 (see McNutt) and the evidence suggests that the phenomenon of follicular atresia, which is so frequently encountered as a normal feature of cyclic ovarian activity in other species, may subscribe to the normal pattern of ovarian activity in the cow. Lastly, while agreeing with Mr. Smythe on the probability of breed differences I would advise against over emphasising the colour changes in the ovaries of Channel Island breeds. The colour observations in the corpus luteum of other breeds are also striking and these changes have been correlated with the age and functional activity of the corpus luteum by several authors.

Yours faithfully,

Wellcome Veterinary Research Station, Frant, Nr. Tunbridge Wells. J. L. HANCOCK.

November 1st, 1948.

TREATMENT OF CHRONIC METRITIS

Sir,—Mr. Hancock's excellent article on reproductive failure in cattle raises at one point the old debatable question of chronic metritis and its treatment by iodine irrigation. Mr. Hancock puts the pros and cons of the question very shortly but succinctly and maintains an open mind as to (*a*) the existence of chronic endometritis as a pathological state occurring sometimes in the bovine uterus and, (*b*) the exact *modus operandi* of irrigation in the clinical entity passing under the phrase "chronic endometritis" compared and contrasted with its effect when used, *e.g.*, in heifers.

I have always believed that the confusion which exists in respect of endometritis is largely a confusion of terminology. In other words, it is largely a matter of where, *e.g.*, pyometra may said to begin. Conditions probably vary tremendously from one district to another but in Lancashire the term "whites" generally means on rectal examination some degree or other of what is best described as chronic endometritis. "Whites" can of course cover any condition from a trichomonas vaginitis to a tuberculous endometritis, but if these are disregarded then by far and away the commonest clinical entity producing the vaginal discharge is an infected uterus. The causes of the infection are numerous and include: brucella abortion, retention of the placenta, twin-calving with retention of the second cleansing, subsequent to acute metritis, following general chills, etc., subsequent to calving especially coinciding with inflammation of the lungs. Whether this condition progresses to pyometra or not is largely a question of treatment. The use of the term "pyometra" in the practice where I am employed is generally confined to what might be more precisely termed "closed pyometra." This may follow conditions such as already mentioned or may, as is well known, originate from other causes, *e.g.*, trichomonas infection. Where chronic metritis ends and pyometra begins, however, is rather vague and is simply a question of the amount of fluid present in the uterus or alternatively whether it is an "open or "closed" case. I have been taught to treat chronic endometritis not primarily by irrigation but largely by improving the general condition of the patient. It is well known here that the best cure for "whites" is "Dr. Green" and cases of "whites" are always slower to mend in winter, *i.e.*, indoors. Irrigation is, however, performed with Lugol's iodine at approximately six weeks after parturition. At this time the bulk of the discharge has come away and the uterine cornua are approaching their normal diameter although they may still be anything up to twice normal size. Irrigation is repeated at weekly intervals if required and solutions other than iodine are used if thought desirable. Uteri in the state so described are not often seen in the slaughterhouse or knacker-yard for the simple reason that the cow either dies or is killed whilst the uterus is still in the acute state, *i.e.*, immediately following parturition, or recovery takes place (naturally or assisted) or finally pyometra develops.

The irrigation fluids almost certainly act by stimulation and probably largely in the manner that similar irrigations will assist recovery in chronic indolent wounds, sinuses, etc.. Any other effects from the irrigating fluid are probably minor although, as Mr. Hancock so clearly brings out, these other effects may be major in producing oestrus in anoestrous heifers. This it certainly does, but the trickiness of the catheterisation limits its use to the adept. I might finally suggest, however, that cantharides (unfortunately not available at present) produces the same effect and no one has so far disputed that this drug acts by irritation on the genito-urinary apparatus including that of virgin heifers.

Yours faithfully,

Blackburn, Lancs. ALEXANDER H. HOGG.

October 23rd, 1948.

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ACUTE GRASS DISEASE

Sir,—May I, through the courtesy of your correspondence column, thank Mr. D. D. Ogilvie for drawing attention to Ferguson's work and suggest that he may be interested to read a letter on the above subject in *Nature* of July 17th, 1948.

Yours faithfully,

ALEX ROBERTSON.

Dept. of Hygiene and Preventive Medicine, Royal (Dick) Veterinary College, Edinburgh, 9.